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BIBLIOTHECA
REGIA
MONACENSIS

BULLETIN NO. 7, REVISED EDITION.

U. S. DEPARTMENT OF AGRICULTURE.

DIVISION OF AGROSTOLOGY.

[Grass and Forage Plant Investigations.]

AMERICAN GRASSES—I.

(ILLUSTRATED.)

BY

F. LAMSON-SCRIBNER,

AGROSTOLOGIST.

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1898.

BIBLIOTHECA
REGIA
MONACENSIS

LETTER OF TRANSMITTAL.

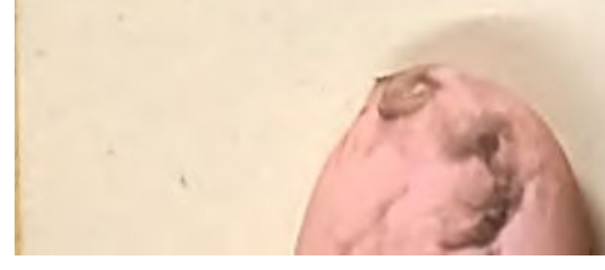
U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF AGROSTOLOGY,
Washington, D. C., April 22, 1898.

SIR: I submit herewith copy for a new and revised edition of Bulletin No. 7 of this division and recommend its publication. This bulletin contains 302 illustrations of native and introduced grasses, accompanied by brief descriptions and notes upon the distribution of each. The law governing the publications of this Department limited the first edition of Bulletin No. 7 to 1,000 copies, which was quickly exhausted; and as applications for it are continually being received, a new edition is necessary to meet this demand. There are also some slight revisions and corrections necessary to bring the work up to date. Manuscript for a similar bulletin illustrating over 300 additional species is now ready for the press, and when published can be bound with No. 7, which may be treated as Part I of "American Grasses Illustrated." Notes upon the use and value of the species of economic interest were published in Bulletin No. 3 of this division, "Useful and Ornamental Grasses."

The drawings are all from carefully selected specimens, the habit sketches being made by Mr. A. H. Baldwin. The enlarged details were drawn by myself, with the exception of a few which were made by Miss M. D. Baker. The engraving is the work of Mr. L. S. Williams and Mr. George P. Bartle. The work has all been done in the office of the division, with the exception of that performed by Mr. Bartle.

Respectfully, F. LAMSON-SCRIBNER,
Agrostologist.

Hon. JAMES WILSON,
Secretary of Agriculture.



INTRODUCTION.

In order to make the present publication more useful to students of grasses, the order Gramineæ and the several tribes into which the order has been divided by our best authorities are here briefly characterized. Under the tribes the genera which are native or have been introduced are enumerated, and those having species figured in this bulletin are marked with an asterisk (*).

GRAMINEÆ—GRASSES.

Characters of the order.—Fibrous-rooted, annual or perennial, herbaceous (rarely woody) plants, with usually hollow, cylindrical (rarely flattened) and jointed stems (*culms*) whose internodes for more or less of their length are enveloped by the sheath-like basal portion of the two-ranked and usually linear, parallel-veined leaves; flowers without any distinct perianth, hermaphrodite or rarely unisexual, solitary or several together, in *spikelets*, which are arranged in panicles, racemes, or spikes, and which consist of a shortened axis (the *rachilla*) and two or more chaff-like, distichous imbricated bracts (*glumes*), of which the first two, rarely one or none or more than two, are empty (*empty glumes*); in the axil of each of the succeeding bracts (excepting sometimes the uppermost) is borne a flower (hence these are named *flowering glumes*). Opposed to each flowering glume, with its back turned toward the rachilla, is (usually) a two-nerved, two-keeled bract or prophyllum (the *palea*), which frequently envelops the flower by its infolded edges. At the base of the flower, between it and its glume, are usually two very small hyaline scales (*lodicules*);

rarely there is a third lodicule between the flower and the palea; stameus, usually three (rarely two or one, or more than three) with very slender filaments and two-celled, usually versatile anthers; pistil with a one-celled, one-ovuled ovary, and one to three, usually two, styles with variously branched, most frequently plumose, stigmas; embryo small, lying at the front and base of the seed, covered only by the thin pericarp; fruit a caryopsis, rich in albumen. (In *Sporobolus* and *Eleusine* the thin pericarp is free from the seed.)

Number of species.—There are about thirty-five hundred known species of grasses, varying in size from the moss-like *Coleanthus* of the North to the tree-like bamboos of the Tropics, which tower to the height of 30 m. or more; and ranging in distribution from Kerguelen Land on the South to the extreme limit of vegetation beyond the Arctic Circle. There is no order of plants more widely distributed, or existing under a greater diversity of soil and climate, and no other order presents such a vast number of individual plants or is so important and directly useful to man.

Series A.—Panicaceæ.

Spikelets one- rarely two-flowered; when two-flowered the second or terminal one is perfect, the first or lower one being either staminate or neuter; rachilla articulated below the empty glumes, the spikelets falling from the pedicels entire, either singly, in groups, or together with the joints of an articulate rachis. The first six tribes belong to this series.

Tribe I.—*Maydeæ*.

Spikelets unisexual, the staminate forming a part of the inflorescence with the pistillate, or each in a separate inflorescence on the same plant; flowering glumes hyaline or much less firm in texture than the outer ones; axis of the female spikelets usually articulated.

This is a small tribe, numbering only sixteen species classed in seven genera. They are nearly all natives of the Tropics, chiefly in the Old World. Indian corn, or maize, is our best known example of the Maydeæ.

Euchlæna Schrad.
Zea Linn.
Tripsacum Linn.*

TRIBE II.—*Andropogoneæ.*

Spikelets in spike-like racemes, two at each joint of the articulate rachis, one sessile and hermaphrodite, one pedicellate, the latter hermaphrodite, staminate, neuter, or reduced to the pedicel alone; glumes usually four, the first and second empty, larger and much firmer in texture than the others, the third usually empty, with a staminate flower in its axil, very rarely awned, the fourth or flowering glume hyaline, usually awned, awn usually twisted or geniculate.

This tribe contains about four hundred species divided among twenty-nine genera, of which the genus *Andropogon*, with one hundred and ninety species, is by far the largest and probably the most important. Sugar cane belongs to this tribe in the genus *Saccharum*. Our best known representatives of the Andropogoneæ are the common broom sedge, *Andropogon virginicus*, and the big blue stem, *Andropogon provincialis*. In the same genus are now classed our species of sorghum. The members of the tribe are distributed throughout the tropical and warmer regions of both hemispheres.

Imperata Cyr.*
Miscanthus Anderss.
Saccharum Linn.
Erianthus Michx.*
Manisuris Linn.*
(*Rottboellia* Linn. f.)
Hackelochloa Kuntze.*
(*Manisuris* Sw. not Linn.)
Trachypogon Nees.
Elionurus HBK.*
Andropogon Linn.*

Tribe III.—*Zoysieæ*.

Spikelets solitary or in groups of two to eight, each group falling as a whole from the continuous rachis, usually one-flowered, hermaphrodite, or staminate and hermaphrodite in the same group; flowering glume less firm in texture than the awned or awnless outer ones, which are herbaceous, chartaceous, or coriaceous; the first glume is usually larger than the second.

A small tribe, numbering about twenty-five species which represent nearly half that number of genera. Fifteen species are natives of the tropical and warmer temperate regions of America. Black grama, or *Galleta*, as the Mexicans name it, species of *Hilaria*, are our best-known representatives of the tribe.

Hilaria Kunth.*
Ægopogon HBK.
Nazia Adans. (*Tragus* Hall).
Zoysia Willd.

Tribe IV.—*Tristegineæ*.

Spikelets all hermaphrodite, in panicles; empty glumes three, or the third with a staminate flower in its axil, herbaceous or chartaceous; flowering glumes membranaceous, awned or awnless; rachilla articulated below the empty glumes.

A small tribe of only seven genera and thirty-three species, natives chiefly of the tropical regions of the Old World. Of the few American species none extend so far north as the United States.

Tribe V.—*Paniceæ*.

Spikelets hermaphrodite, terete or flattened on the back; glumes three or four (rarely only two); when four there is occasionally a staminate flower or a palea in the axil of the third; the uppermost or flowering glume of the hermaphrodite flower is always firmer in texture than the outer glumes, of which the first is usually smaller than the others; axis of the inflorescence not articulated, the rachilla being articulated below the empty glumes, the spikelets falling off singly from their pedicels.

This is one of the largest tribes in the order Gramineæ. It contains twenty-two genera with over six hundred and thirty species. *Panicum*, the principal genus, is the largest among grasses, numbering three hundred species. The *Paniceæ* are very widely distributed throughout the tropical and temperate regions of the world. Crab-grass and the millets are among our best known examples of this tribe.

Reimaria Flügge.*
Paspalum Linn.*
Anthænantia Beauv.
Amphicarpon Raf.*
Eriochloa Kunth.*
Panicum Linn.*
Oplismenus Beauv.
Chætochloa Scribn.*
(*Setaria* Auct.)
Cenchrus Linn.*
Pennisetum Pers.*
Stenotaphrum Trin.*

Tribe VI.—*Oryzeæ*.

Spikelets usually much compressed laterally, one-flowered, staminate, pistillate, or hermaphrodite; empty glumes two or none, the flower being subtended by the floral glume and palea alone, the latter one-nerved and regarded by some as a second glume; stamens frequently six; axis of the inflorescence not articulated.

A small tribe of about forty species divided among sixteen genera, mostly confined to tropical America. One of the best known and most extensively used of the cereals, rice (*Oryza sativa*), belongs here.

Hydrochloa Beauv.
Pharus Linn.
Luziola Juss.*
Zizaniopsis Doell and Asch.
Zizania Linn.
Oryza Linn.
Homalocenchrus Mieg.*
(*Leersia* Sw.)

Series B.—Poaceæ.

Spikelets one- to many-flowered, the imperfect or rudimentary flower, if any, usually uppermost; rachilla

usually articulated above the empty glumes, so that these remain after the fall of the fruiting glume.[1] In spikelets with two or more flowers these are separated by a manifest internode of the rachilla, and in such cases the rachilla is usually articulated below each flowering glume.

Tribe VII.—*Phalarideæ*.

Spikelets more or less laterally compressed, one- or rarely three-flowered; glumes five, the first two empty and below the articulation of the rachilla, the third and fourth above the articulation, usually empty, very unlike the outer ones, rarely subtending staminate flowers, sometimes reduced to mere bristles, the fifth glume with a one-nerved or nerveless palea and a hermaphrodite flower.

A small tribe, comprising six genera with about sixty species of comparatively little importance. Several of the species, sweet vernal grass and vanilla grass, are remarkable for possessing a peculiar fragrance due to their containing coumarin. Canary-grass is one of the best known members of this tribe.

Phalaris Linn.*
Anthoxanthum Linn.*
Savastana Schrank.*
(*Hierochloë* Gmelin).

Tribe VIII.—*Agrostideæ*.

Spikelets all hermaphrodite, one-flowered with three glumes, the first two empty (very rarely wanting), usually as long as or exceeding the third or floral glume; rachilla sometimes prolonged behind the palea into a naked or plumose bristle. Palea two-nerved (one-nerved in *Cinna*), nerveless, or (in some *Agrostis* species) wanting.

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[1] *Alopecurus*, *Cinna*, *Spartina*, and *Holcus* among our grasses, have the rachilla articulated below the first pair of glumes, and the spikelets fall off entire.

This is, next to the *Festuceæ*, the largest tribe in the order, numbering seven hundred species arranged in forty-six genera. The species are distributed throughout all the temperate and colder regions of the world and many occur within the Tropics. The genus *Agrostis*, from which the tribe derives its name and from which comes the word "agrostologist," has about one hundred species, found in all parts of the world, especially in the north temperate zone. Some of our most important meadow grasses—notably Herd's-grass and timothy—belong to this tribe.

Aristida Linn.*
Stipa Linn.*
Oryzopsis Michx.*
Eriocoma.*
Milium Linn.*
Muhlenbergia Schreb.*
Brachyelytrum Beauv.*
Lycurus Kunth.
Pereilema Presl.
Heleochloa Host.*
Phleum Linn.*
Alopecurus Linn.*
Coleanthus Seid.
Phippsia R. Br.*
Sporobolus R. Br.*
Epicampes Presl.*
Polypogon Desf.
Limnodia L. H. Dewey.*
(*Thurberia* Benth.)
Arctagrostis Griseb.
Cinna Linn.*
Agrostis Linn.*
Gastridium Beauv.
Calamagrostis Roth.*
Ammophila Host.*
Calamovilfa Scribn.*
Apera Adans.
Lagurus Linn.

TRIBE IX.—*Aveneæ*.

Spikelets two- to several-flowered; outer empty glumes usually longer than the first floral glume; one or more of the floral glumes awned on the back or from between the teeth of the bifid apex; awn usually twisted or geniculate; the callus, and usually the joints of the rachilla, hairy.

A tribe comprising twenty-three genera and over three hundred species widely distributed in the temperate regions of both the Old and the New World, particularly abundant in South Africa and Australia, a few extending beyond the arctic circle.

Several of the species are valued as forage plants. Cultivated oats, *Avena sativa*, is the best-known example of this tribe.

Holcus Linn., in part.*
Aira Linn.*
Weingaertneria Bernh.*
(*Corynephorus* Beauv.)
Deschampsia Beauv.*
Trisetum Pers.*
Avena Linn.*
Arrhenatherum Beauv.*
Danthonia DC.*

Tribe X.—*Chlorideæ.*

Spikelets one- to several-flowered in one-sided spikes or racemes; these racemes digitate or fasciculate, rarely solitary; flowering glumes usually keeled, entire and unawned, or toothed, and with one or three straight awns.

A small tribe of twenty-seven genera and one hundred and fifty-five species, characterized chiefly by the inflorescence, which is nearly that of *Paspalum*. The awns when present are not dorsal nor twisted, as in *Agrostideæ* and *Aveneæ*. Chiefly natives of tropical and subtropical countries; a few are widely distributed as weeds throughout the warmer parts of the world. A number are good turf-forming grasses, and are valued for grazing purposes. One of these is the celebrated buffalo-grass of the Western plains, which is remarkable for having the staminate and pistillate spikelets separate and in unlike inflorescences, either upon the same plant (monœcious) or upon different plants (diœcious).

Capriola Adans.*
(*Cynodon* Pers.)
Spartina Schreb.*
Campulosus Desv.*
(*Ctenium* Panzer).
Chloris Sw.*
Trichloris Fourn.*
Gymnopogon Beauv.*
Schedonnardus Steud.*
Bouteloua Lag.*
Beckmannia Host.*
Eleusine Gaertn.*
Dactyloctenium Willd.*
Leptochloa Beauv.*
Bulbilis Raf.*
(*Buchloë* Engelm.)

Tribe XI.—*Festuceæ*.

Spikelets two- to many-flowered, usually hermaphrodite, pedicellate in racemes or panicles, the latter sometimes dense and spike-like; flowering glumes usually longer than the empty ones, awnless or with one to several straight (rarely bent) awns which are either terminal or borne just below the apex.

This is the largest tribe in the order, numbering seventy-six genera and about seven hundred and twenty-five species. It contains the most important meadow grasses of the temperate regions as well as the more prevalent grasses of the higher mountains within the Tropics. The genus *Poa*, which includes Kentucky blue-grass, Texas blue-grass, etc., numbers one hundred species, and an equal number of species are included in the genus *Eragrostis*. The Fescues number eighty species, and the tribe takes its name from this genus—*Festuca*. Orchard grass, *Dactylis glomerata*, is a well-known example of this tribe.

Pappophorum Schreb.*
Cottea Kunth.*
Cathestecum Presl.*
Scleropogon Philippi.*
Monanthochloë Engelm.*
Munroa Torrey.*
Orcuttia Vasey.*
Gynerium HBK.
Arundo Linn.
Phragmites Trin.*
Blepharidachne Hack.
(*Eremochloë* S. Wats.)
Triodia R. Br.*
Sieglingia Bernh.
Redfieldia Vasey.*
Dissanthelium Trin.*
Molinia Schrank.
Eragrostis Host.*
Eatonia Raf.*
Koeleria Pers.*
Catabrosa Beauv.*
Melica Linn.*
Korycarpus Zea.*
(*Diarrhena* Raf.)
Pleuropogon R. Brown.*
Uniola Linn.*
Distichlis Raf.*
Briza Linn.*
Dactylis Linn.*
Cynosurus Linn.*
Lamarckia Moench.*
Poa Linn.*
Colpodium Trin.
Dupontia R. Br.
Scolochloa Link.
Graphephorum Desv.*
Panicularia Fabr.*
(*Glyceria* R. Br.)
Puccinellia Parl.*
Festuca Linn.*
Bromus Linn.

Tribe XII.—*Hordeæ*.

Spikelets one- to many-flowered, usually hermaphrodite, sessile along the common rachis, forming a simple or compound spike;[1] glumes awned or awnless.

A small tribe of twenty genera and about one hundred and thirty species. It is an important division, however, for it includes rye, barley, and the many varieties of wheat. English and Italian Rye-grasses (*Lolium* species) are the chief meadow grasses of the tribe.

Nardus Linn.*
Lolium Linn.*
Lepturus R. Br.
Scribneria Hack.*
Agropyron Gaertn.*
Secale Linn.
Triticum Linn.
Hordeum Linn.*
Elymus Linn.*
Asperella Humb.*

Tribe XIII.—*Bambuseæ*.

Spikelets two- to many-flowered (rarely only one-flowered) in racemes or panicles; empty glumes at the base of the spikelet two to several; flowering glumes many-nerved, awnless, or very rarely short-awned; culms woody, at least near the base, and perennial; leaf blade usually with a short petiole articulated with the sheath from which it finally separates.

A comparatively small tribe of twenty-three genera and about one hundred and eighty-five species. The species are confined chiefly to the region within the Tropics. Many of them are of very great importance to the natives of the countries where they grow. Manufactured articles of bamboo, either of use or for ornament, are now a part of the commerce of the world. The bamboos are remarkable for their woody stems and often arborescent or tree-like habit of growth, some of the

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[1] Strictly the spike is simple when the sessile spikelets are one-flowered, and compound when they are more than one-flowered.

species attaining the height of 25 to 30 m. In parts of India they form extensive forests. One species in this tribe has leaves 2 to 5 m. long by 10 to 25 cm. wide; another, a Cuban species, has leaves 5 to 8 cm. long and as fine as a horse hair. Fleshy and edible, apple-like fruits are borne by some of the species.

Arundinaria Michx.

F. L. S.

AMERICAN GRASSES—I.

(ILLUSTRATED.)

BY F. LAMSON-SCRIBNER.

18337—No. 7——2

METRIC MEASUREMENTS AND THEIR ENGLISH EQUIVALENTS.

The metric system adopted in this Bulletin is now quite generally employed in botanical and other scientific publications. For those unfamiliar with this system the following expression of equivalents may be useful:

1 millimètre (1 mm.)=one twenty-fifth of an inch—exactly 0.0394 inch.

1 centimètre (1 cm.)=nearly one-half of an inch; 10 cm.=about 4 inches.

1 décimètre (1 dm.)=about 4 inches, or 3 dm.=one foot.

1 mètre (1 m.)=about 3 feet 3⅜ inches—exactly 39.37079 inches.

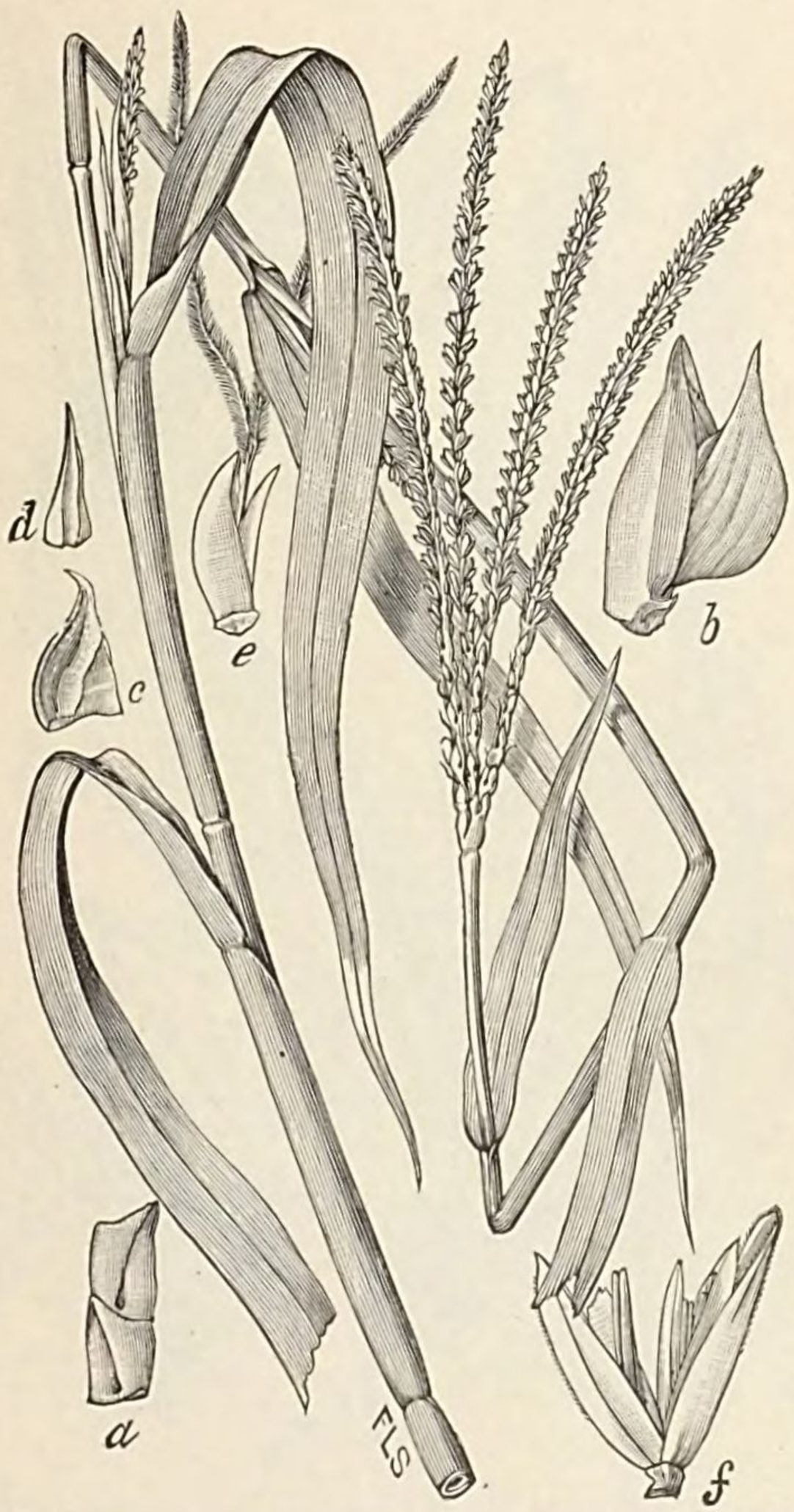

FIG. 1. **Tripsacum dactyloides** L. GAMA-GRASS.—A stout, coarse, branching perennial 9 to 24 dm. high, with long and rather broad leaves and a spicate inflorescence, the spikes being 2 to 4 on the main stem and usually solitary on the branches.—Low meadows, moist thickets, ditches, etc.; Rhode Island to Florida, Kansas, and Texas. [Mexico.] April–October.

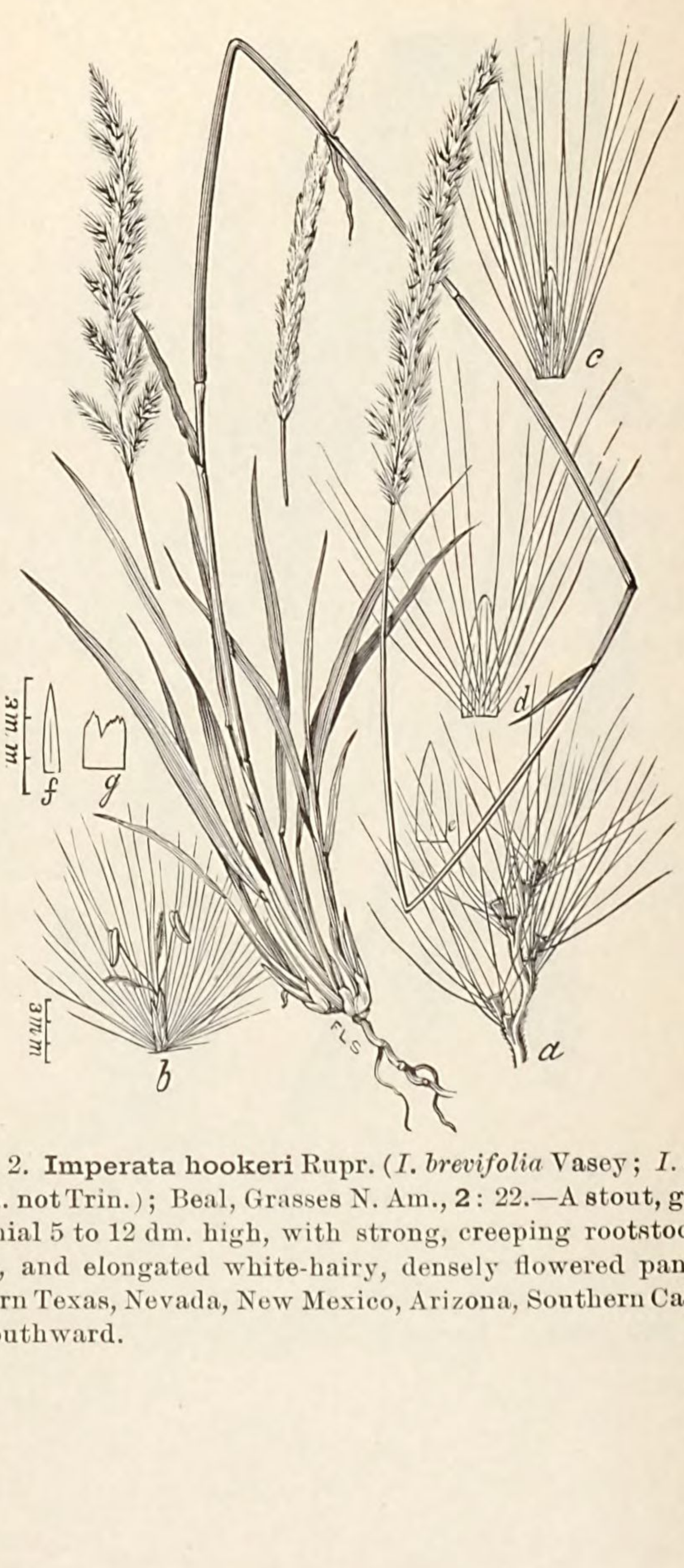

FIG. 2. **Imperata hookeri** Rupr. (*I. brevifolia* Vasey; *I. caudata* Scribn. not Trin.); Beal, Grasses N. Am., **2**: 22.—A stout, glabrous perennial 5 to 12 dm. high, with strong, creeping rootstocks, flat leaves, and elongated white-hairy, densely flowered panicles.—Western Texas, Nevada, New Mexico, Arizona, Southern California and southward.

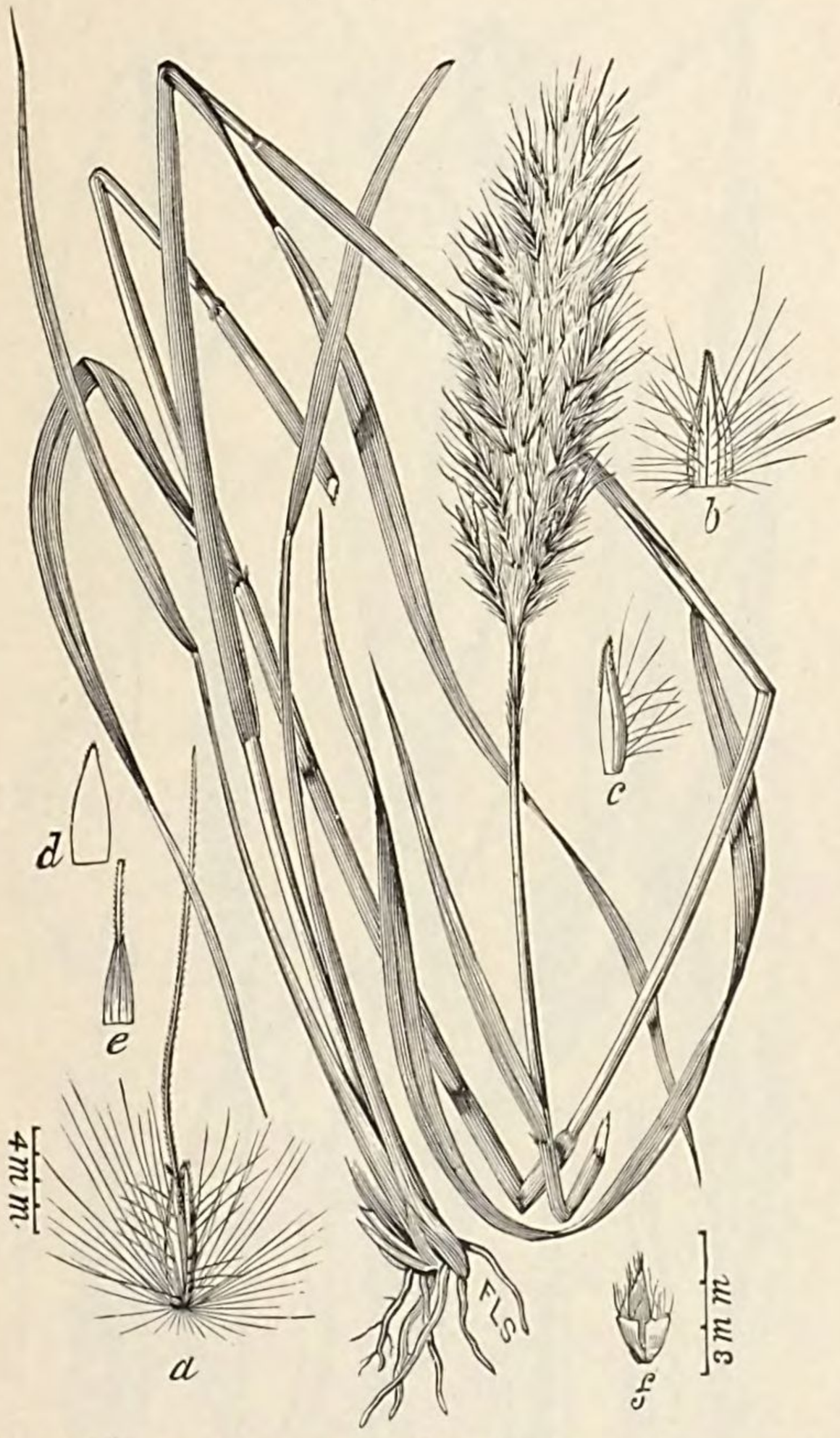

FIG. 3. **Erianthus compactus** Nash in Bull. Torr. Bot. Club, **22**: 419; Britton and Brown, Ill. Fl., **1**: 99. DENSELY FLOWERED PLUME-GRASS.—A stout, erect perennial 12 to 24 dm. high, with long, narrow leaves and densely flowered, oblong, brownish or reddish panicles 10 to 15 cm. long, the branches spreading in anthesis.—Meadows and swamps, mostly near the coast; New Jersey to Virginia and Tennessee. August–October.

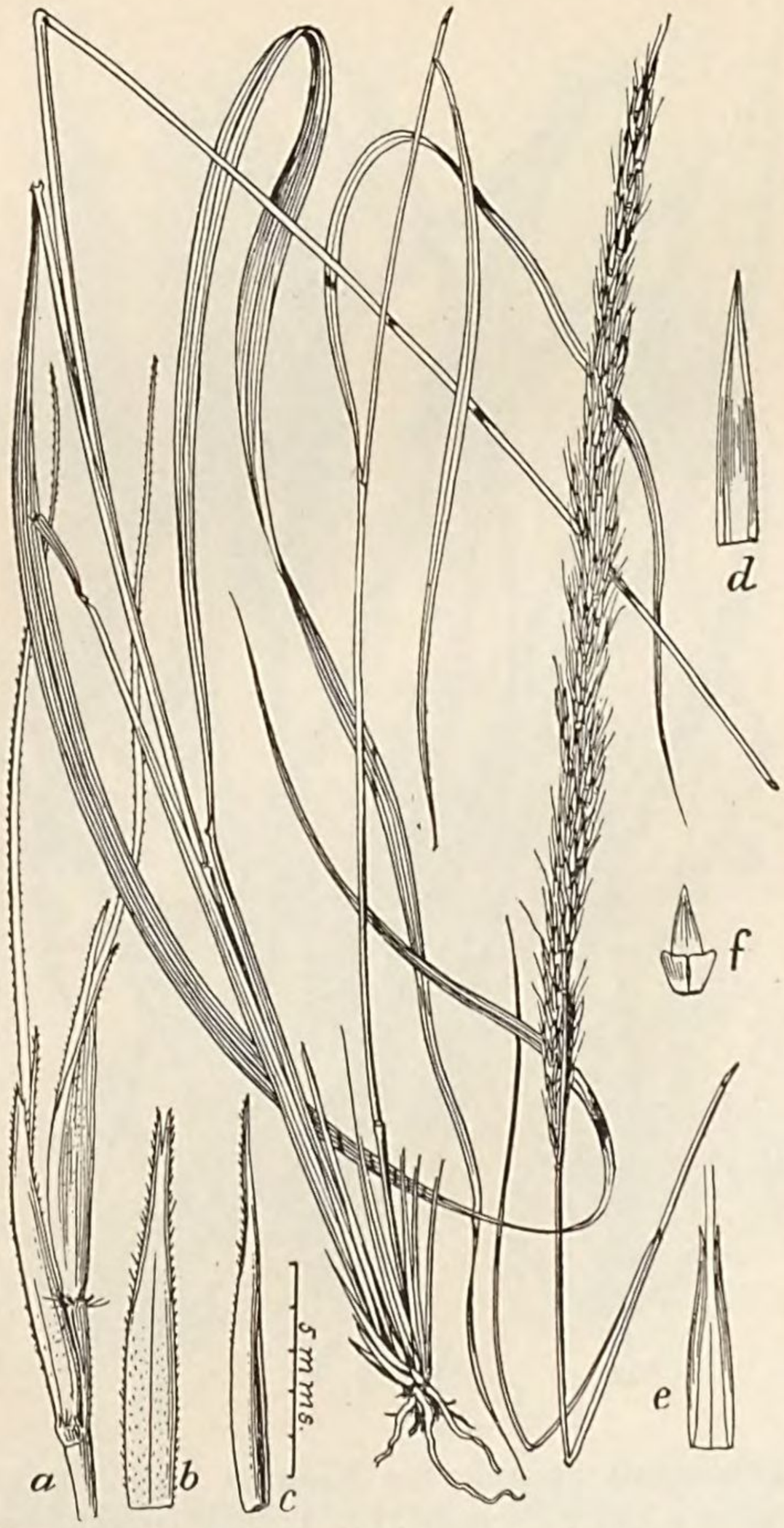

FIG. 4. **Erianthus strictus** Baldw.; Beal, Grasses N. Am., **2**: 29.—A stout, erect perennial 12 to 24 dm. high, with long, narrow, flat leaves and strict, bearded (with awns), but not hairy, panicles, 20 to 40 cm. long.—River bottoms, Tennessee and Georgia to Mississippi and Texas. September, October.

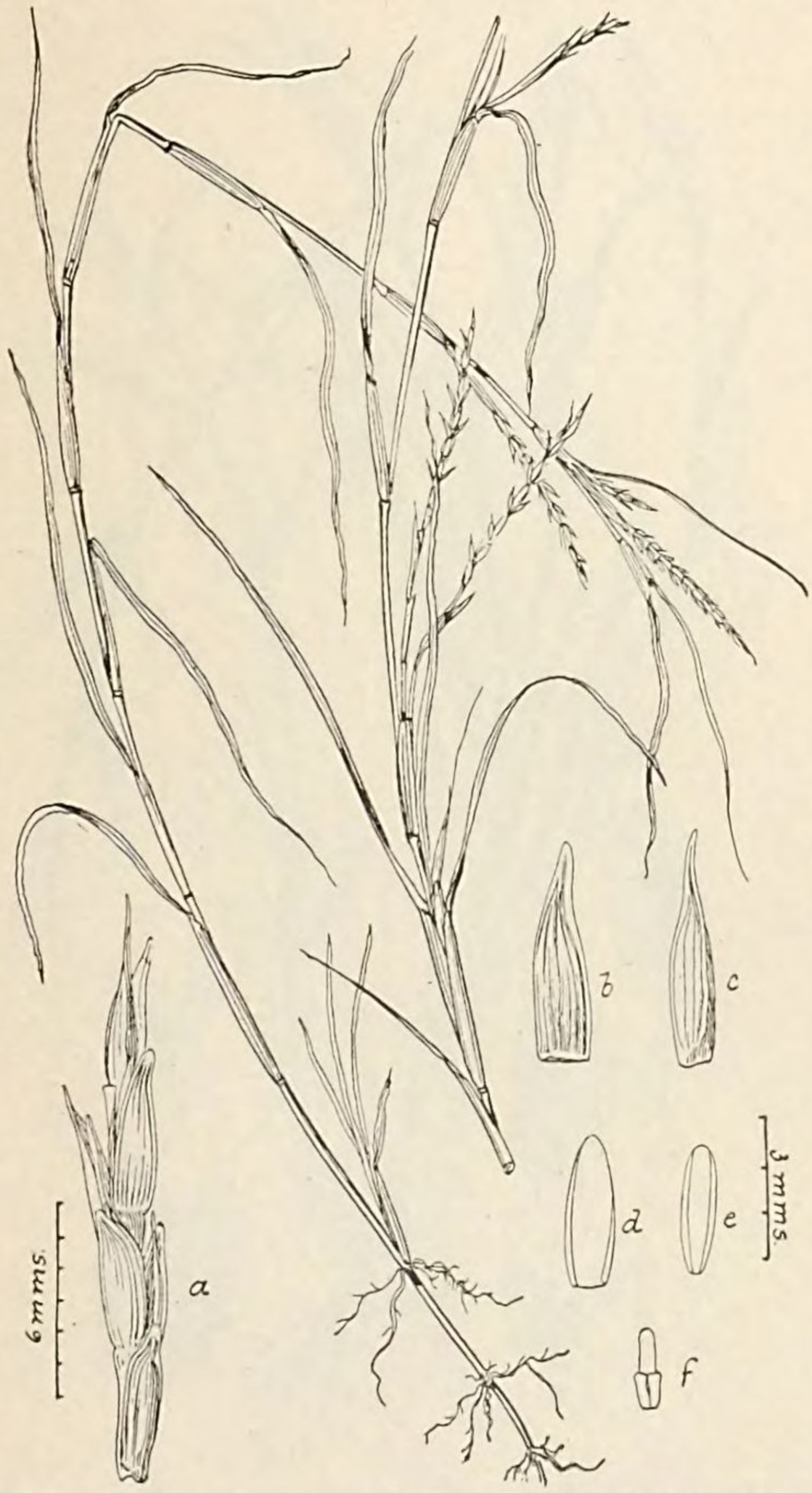

FIG. 5. **Manisuris compressa** (L. f.) Kuntze (*Rottboellia compressa* L. f.; *Hemarthria fasciculata* Kunth). MAT-GRASS.—A creeping perennial, with ascending and usually much branched, flattened culms 10 to 14 dm. high, and numerous slender spikes.—River banks, southwestern Texas. [Tropical and subtropical regions of both hemispheres.] September.

FIG. 6. **Hackelochloa granularis** (Sw.) Kuntze (*Manisuris granularis* Sw.; *Cenchrus granularis* Linn.); Beal, Grasses N. Am., **2**: 33. LIZARD-TAIL-GRASS.—A much-branched, leafy annual, 3 to 12 dm. high, with numerous slender spikes in irregular, leafy panicles.—A weed in all tropical countries, extending northward into the warmer parts of the Southern and Southwestern States.

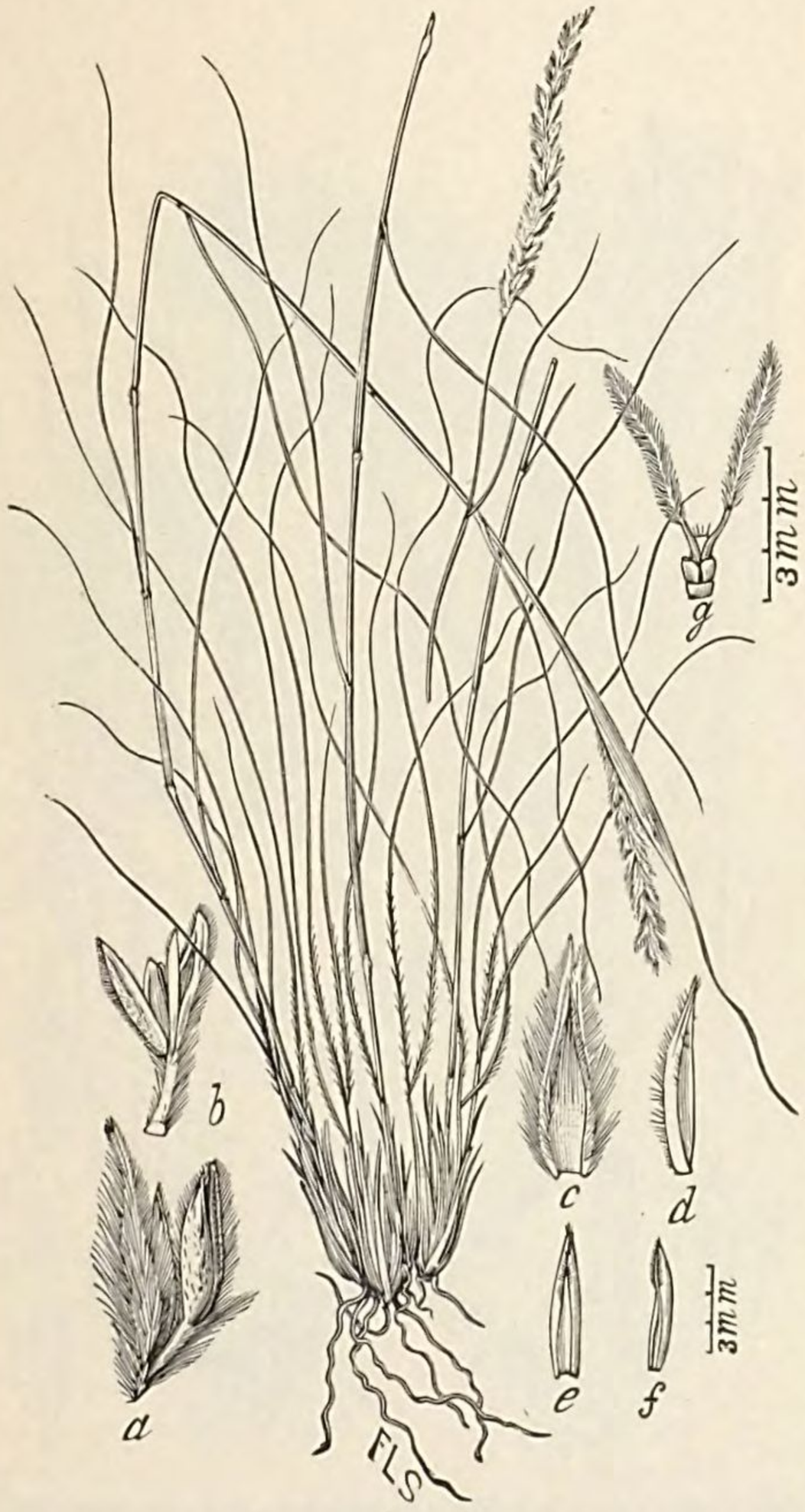

FIG. 7. **Elionurus barbiculmis** Hack.; Beal, Grasses N. Am., **2**: 37.—A slender, erect perennial 4 to 7 dm. high, with very narrow, filiform, hairy leaves and silky-villous, solitary spikes terminal on the culm or its branches.—Rocky hills and canyons, western Texas to Arizona. [Northern Mexico.] June–September.

FIG. 8. **Andropogon saccharoides torreyanus** (Steud.) Hack; Britton and Brown, **1**: 103 (*Andropogon torreyanus* Steud.). TORREY'S SILVER BEARD-GRASS.—A variable native perennial 3 to 9 dm. high, with rather long, usually glaucous, flat leaves, and narrow silvery-bearded panicles.—Dry prairies and mesas, Kansas to Texas, New Mexico, and Nevada. [Mexico.] July–October.

FIG. 9. **Andropogon glomeratus** (Walt.) B. S. P. (*Andropogon macrourus* Michx.). BROOK-GRASS.—A stout perennial 6 to 12 dm. high, with dense, more or less elongated panicles, the branches usually very much crowded.—Low grounds and marshes, southern New York to Florida, southern California and Nevada. [Mexico, Lower California, Cuba, and Jamaica.] September–January.

FIG. 10. **Andropogon virginicus** L. BROOM SEDGE.—A rigidly erect perennial 6 to 12 dm. high, with the culms flattened near the base, and narrow, elongated, and loosely branched panicles of silky-bearded racemes, for the most part partially inclosed within smooth, spathe-like bracts.—Old fields and borders of woods, usually in dry soil, Massachusetts to Florida and Texas. [Cuba.] August–October.

FIG. 11. **Andropogon argyræus** Schultes. SILVER-BEARD or SILVERY BEARD-GRASS.—A rather slender native grass 6 to 9 dm. high, with narrow leaves and silky-bearded racemes, which are in pairs, terminal on the culm or its branches.—In dry, sandy soil in open woods and along thicket borders from Delaware to Missouri and southward to the Gulf. August–October.

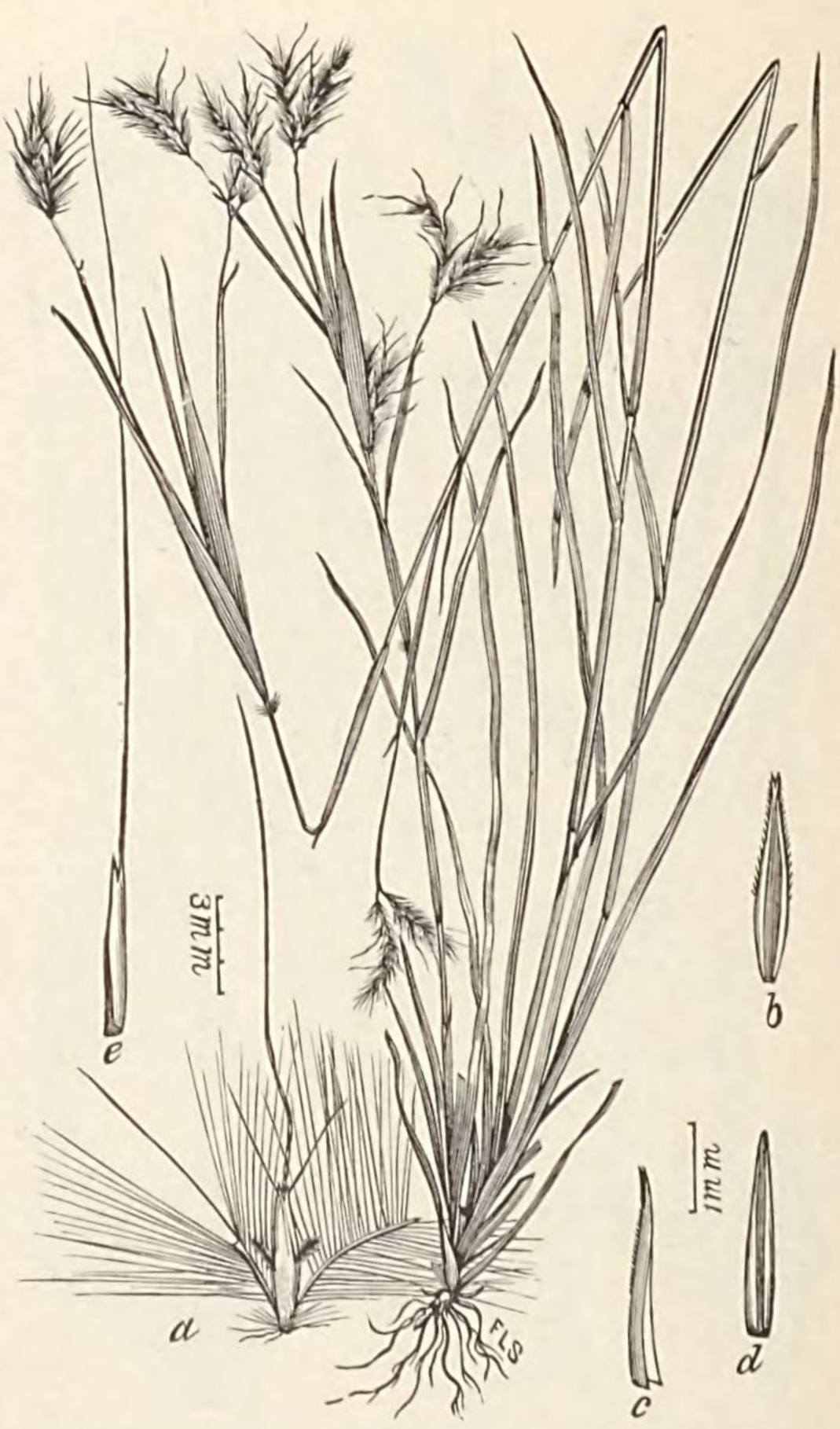

FIG. 12. **Andropogon elliottii** Chapm. ELLIOTT'S BROOM SEDGE.—A slender, upright perennial 6 to 9 dm. high, the plumose racemes in pairs or ternate and subtended by conspicuously inflated upper leaf sheaths.—Dry upland woods or low pine barrens, Delaware and Pennsylvania to central Florida and Texas. July–October.

FIG. 13. **Andropogon scoparius** Michx. LITTLE BLUE-STEM.—A rather slender perennial 3 to 9 dm. high, the solitary racemes terminating the culms and branches.—Dry fields and borders of woods, New Brunswick westward to the Saskatchewan, southward to Florida, Texas, and southern California. [Mexico.] July–October.

FIG. 14. **Andropogon provincialis** Lam. (*A. furcatus* Muhl.) BIG BLUE-STEM.—A stout perennial 6 to 16 dm. high, with long leaves, and rather thick spikes 3 to 10 cm. long.—From the Rocky Mountains eastward to the Atlantic and southward to the Gulf of Mexico. August–October. Especially abundant and valued for hay in the prairie regions.

FIG. 15. **Andropogon nutans avenaceus** (Michx.) Hack. INDIAN GRASS.—A stout perennial 12 to 18 dm. high, with long leaf blades, and long, rather dense, usually somewhat nodding brownish panicles.—Dry fields, glades, and borders of woods, Ontario to South Dakota and Manitoba, south to Florida, Texas, and Arizona. [Mexico, Central and South America.] July-October.

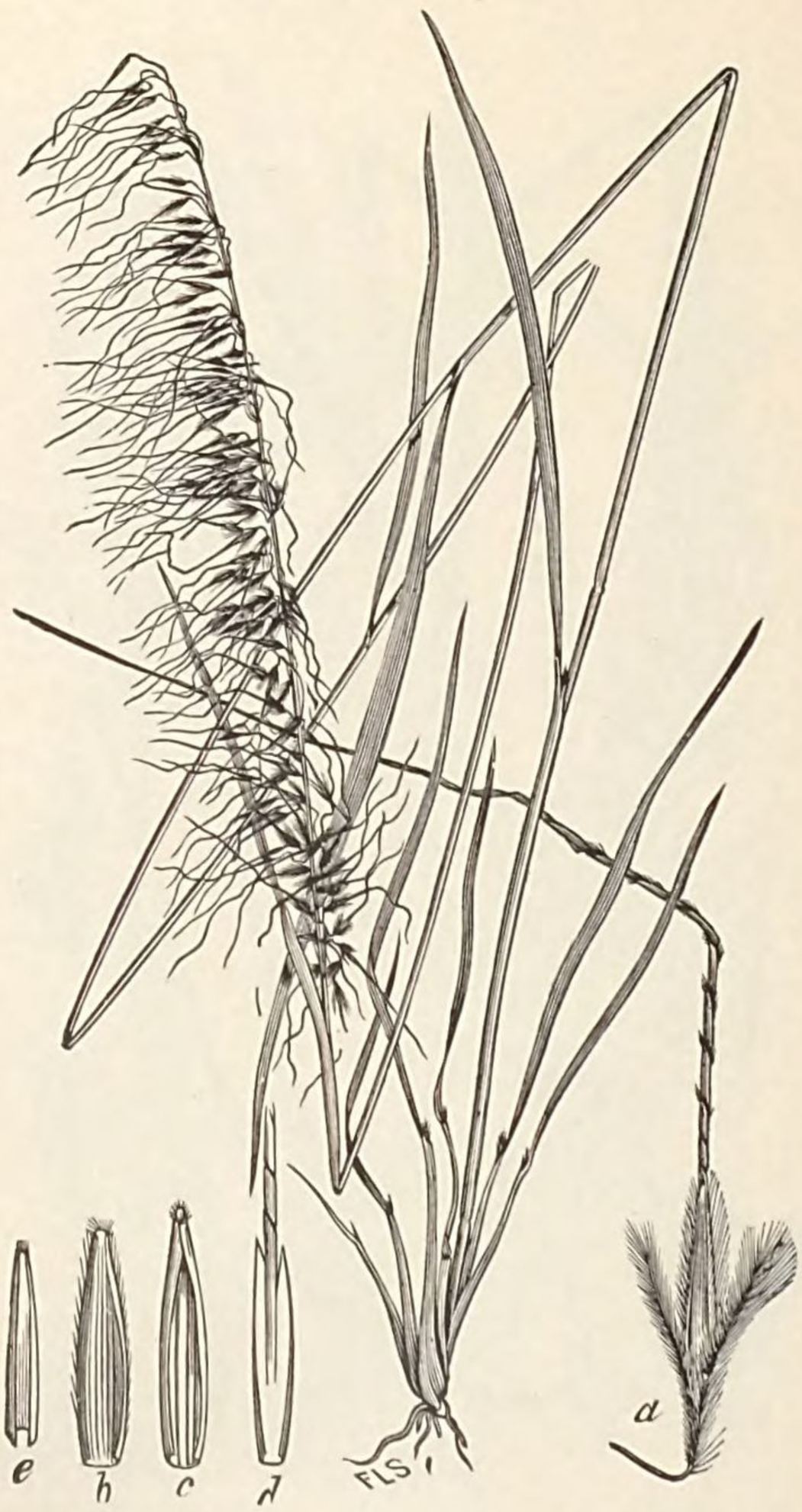

FIG. 16. **Andropogon unilateralis** Hack.; Beal, Grasses N. Am., **2**: 60. (*Andropogon secundus* Ell. not Willd.) BANNER SORGHUM.—A rather stout perennial, 6 to 12 dm. high, with narrow, one-sided, many-flowered panicles 18 to 25 cm. long, and long-awned spikelets.—Low pine lands, South Carolina, Florida. June–October.

FIG. 17. **Andropogon pauciflorus** (Chapm.) Hack.; Beal, Grasses N. Am., **2**: 61. (*Sorghum pauciflorum* Chapm.). FEW-FLOWERED SORGHUM.—A rather stout, branching, leafy annual, 6 to 12 dm. high, with few-flowered panicles and long-awned spikelets.—Dry fields, Florida. [Cuba.] October.

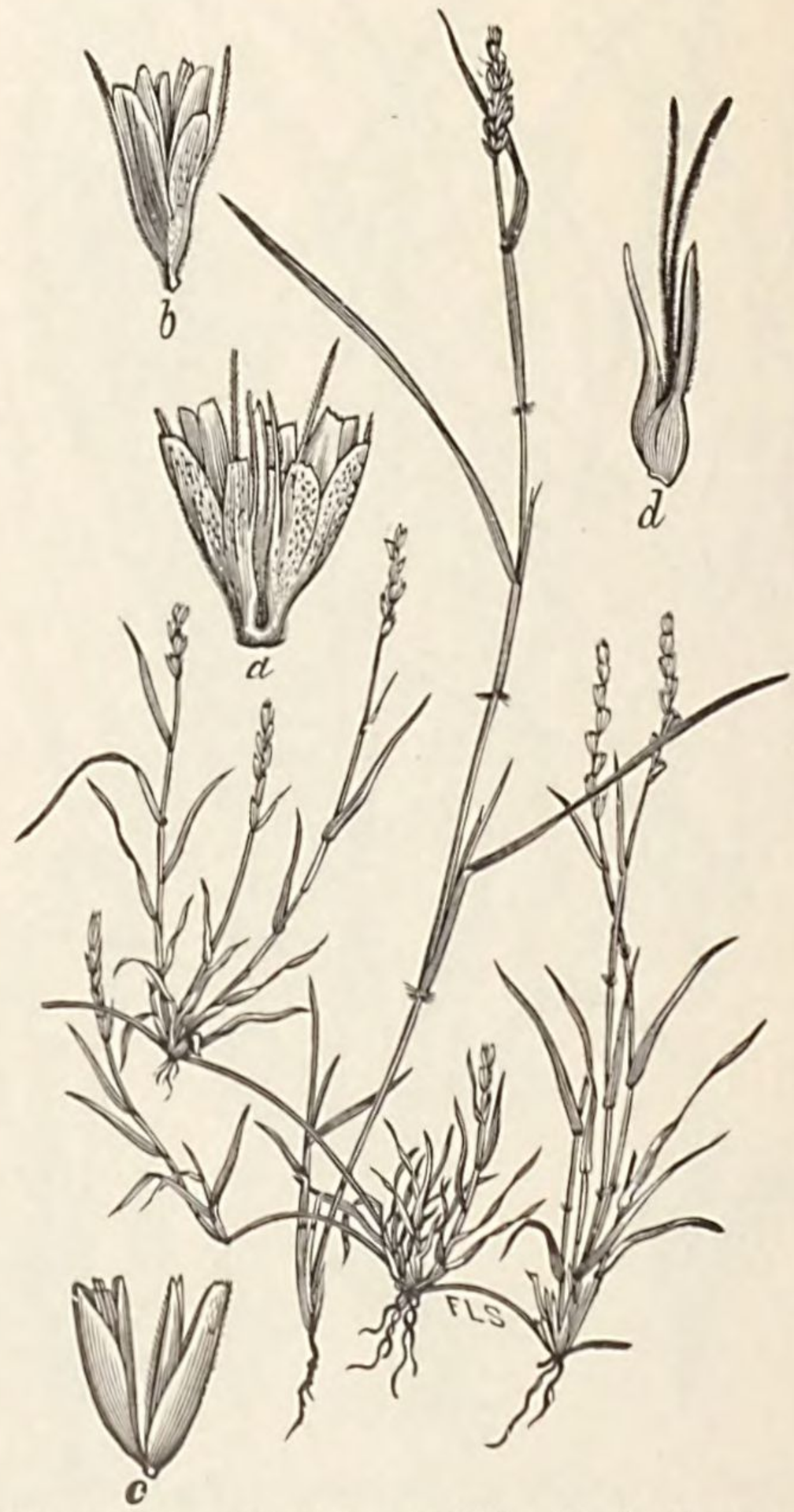

FIG. 18. **Hilaria cenchroides** HBK.; Beal, Grasses N. Am., **2**: 68. CURLY MESQUITE.—A slender, creeping perennial, with upright leafy branches 1 to 3 dm. high.—Dry prairies, mesas, and foothills, Texas to Arizona. [Mexico.] April–October. One of the most valuable of the native grasses for grazing.

FIG. 19. **Hilaria mutica** (Buckl.) Benth.; Beal, Grasses N. Am., **2** : 69. BLACK GRAMA.—A smooth, branching perennial 4 to 6 dm. high, with densely flowered, usually straw-colored spikes about 5 cm. long.—Dry mesas, Texas to southern California. May-September. Valued for forage, especially for grazing.

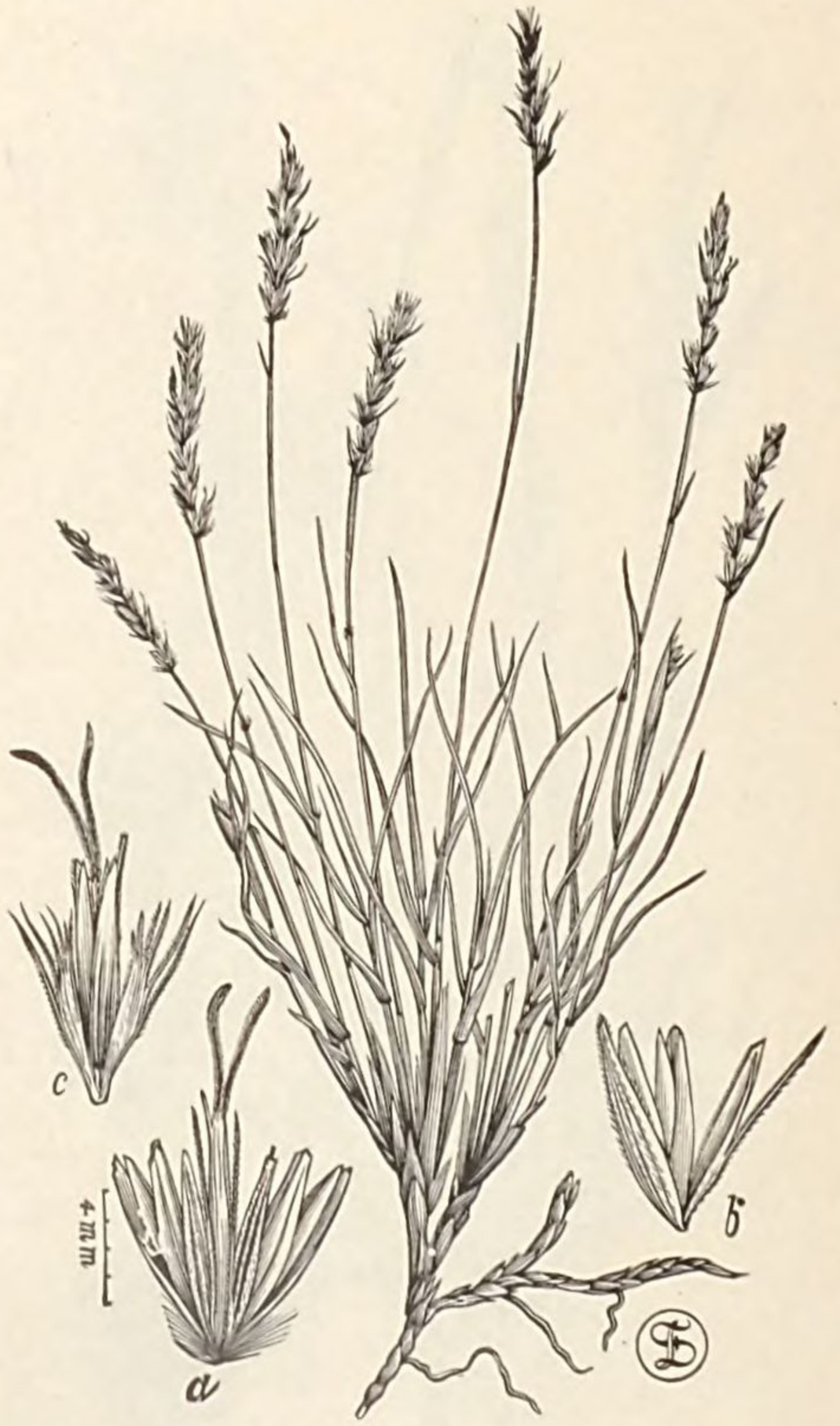

FIG. 20. **Hilaria jamesii** (Torr.) Benth.; Beal, Grasses N. Am., **2**: 70. BLACK BUNCH-GRASS.—A rather coarse, branching perennial 3 to 5 dm. high, with erect, often purplish spikes 5 to 8 cm. long.—Mesas and table-lands of southern Colorado and Utah to New Mexico and southern California. March–July. A valuable hay or pasture grass.

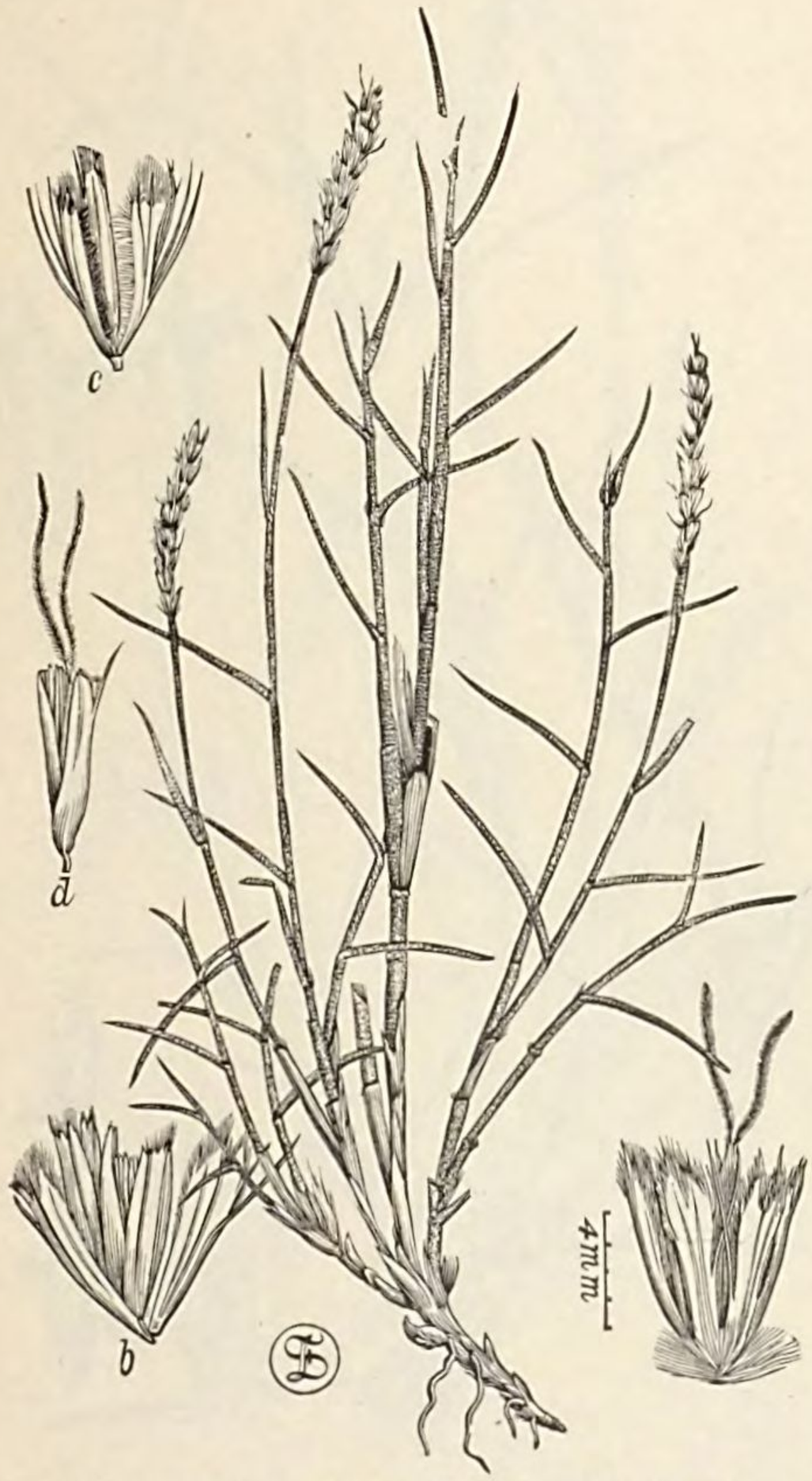

FIG. 21. **Hilaria rigida** (Thurb.) Vasey; Beal, Grasses N. Am., **2**: 68. (*Pleuraphis rigida* Thurb.) GALLETA.—A coarse, much-branched, and woody perennial 6 dm. high, growing in great clumps, somewhat resembling dwarf bamboos in habit —Deserts, southern Utah to Arizona and southern California. [Lower California.] May-July.

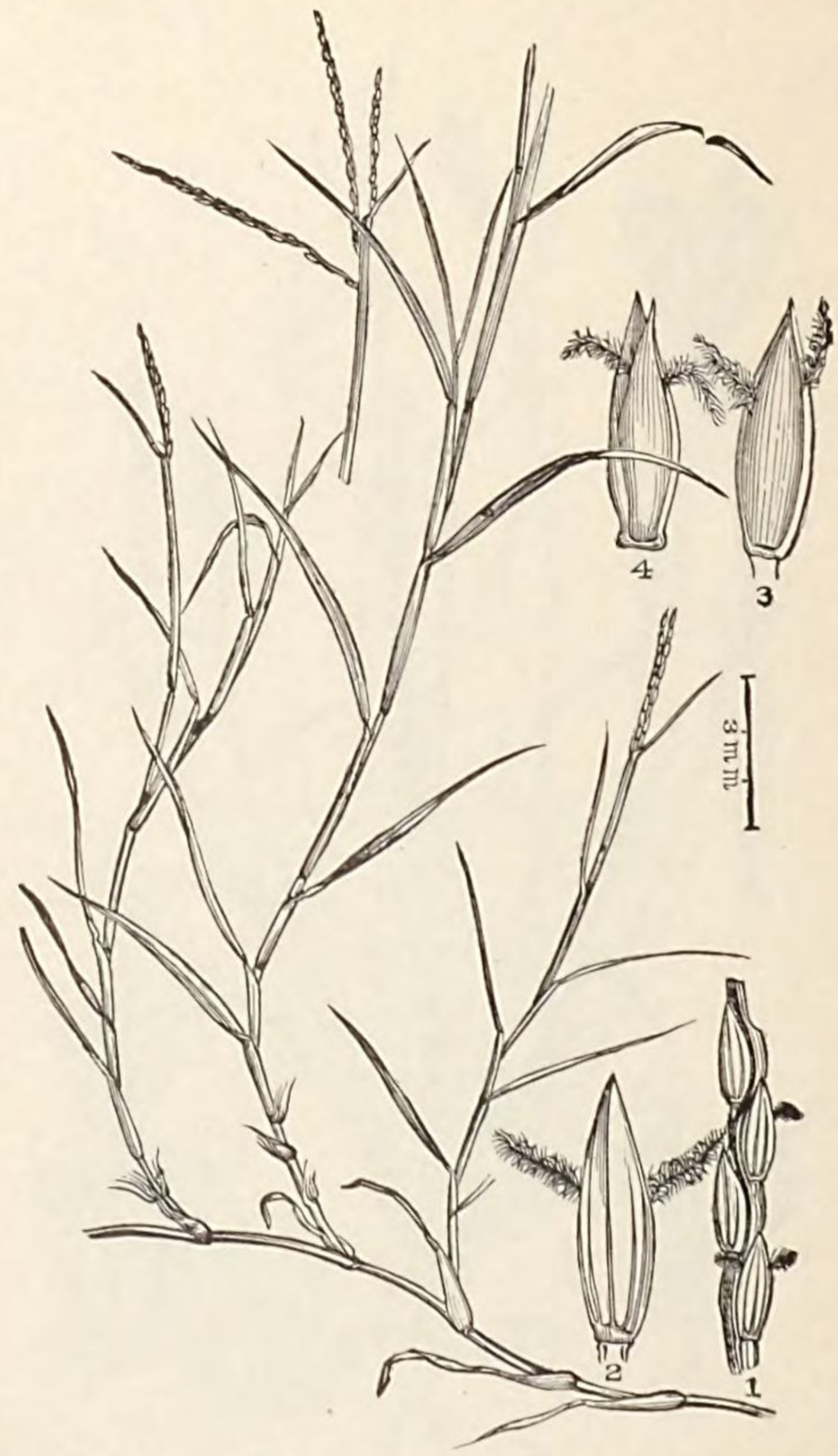

FIG. 22. **Reimaria oligostachya** Munro in Benth. Journ. Linn. Soc.; Beal, Grasses N. Am., **2**: 80. CREEPING REIMARIA.—An extensively creeping perennial, with flat leaves and upright flowering branches 2 to 4 dm. high, bearing two to four spikes 4 to 7 cm. long.—Ditches and brackish river shores, often in water, eastern Florida. [Cuba.] April–September.

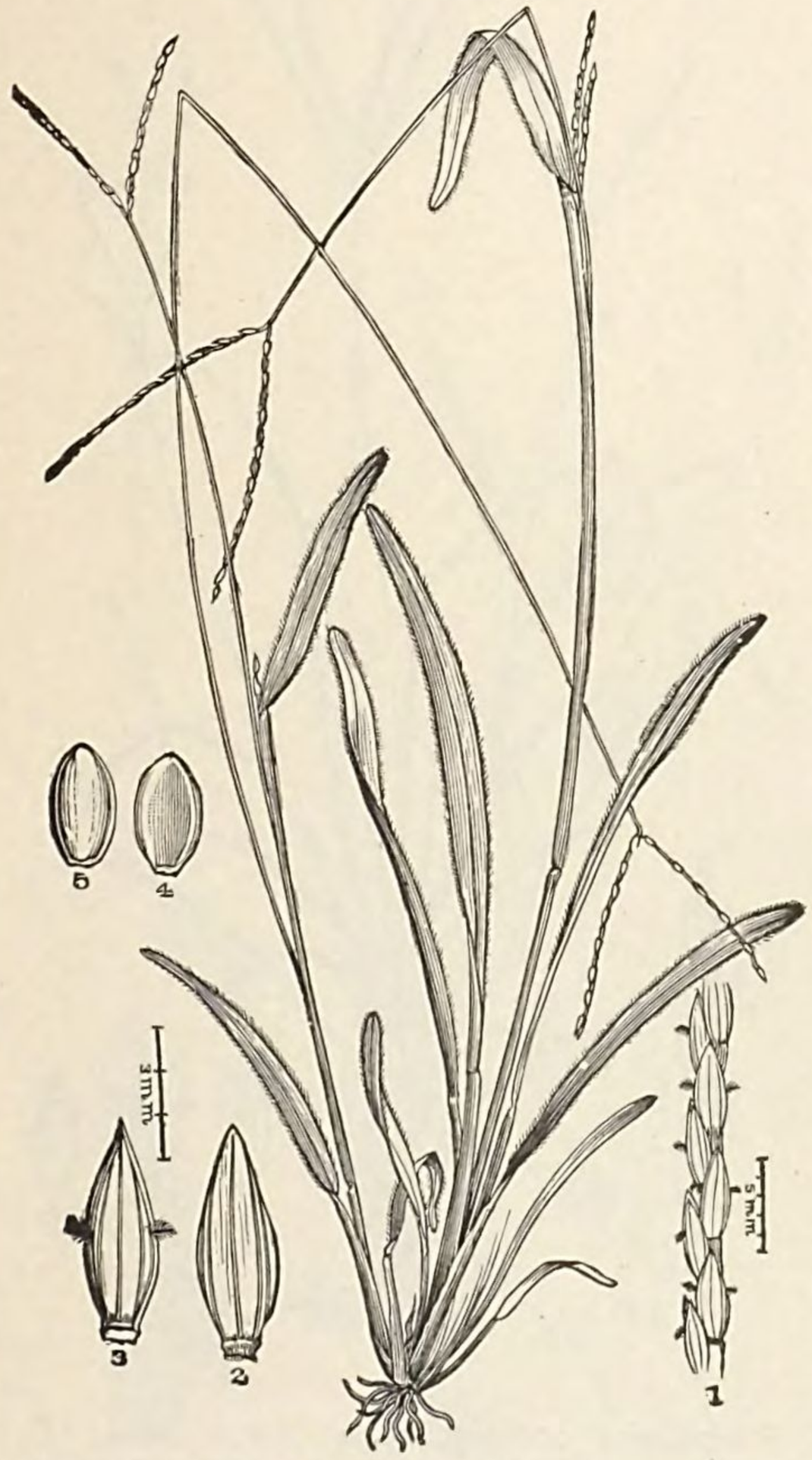

FIG. 23. **Paspalum paspaloides** (Michx.) Scribn. (*P. elliottii* S. Wats.; *P. digitaria* Poir.). ELLIOTT'S PASPALUM.—A soft perennial grass 5 to 8 dm. high, geniculate and more or less creeping at the base, with rather broad, flat leaves and slender spikes, which are usually in pairs.—Borders of ponds and ditches and in low pine barrens near the coast, Maryland to Texas. April–August.

FIG. 24. **Paspalum compressum** (Sw.) Nees. (*P. platycaule* Poir.). LOUISIANA or CARPET-GRASS.—A slender, erect, or more frequently prostrate and extensively creeping perennial, rooting at the nodes and sending up numerous leafy or flower-bearing branches 1.5 to 6 dm. high, with 2 to 6 subdigitate slender spikes and small, acutish spikelets.—Low ground and moist pastures, abundant near the coast from Virginia to Texas. [Mexico, Central and South America, and West Indies.] April–October. A valuable pasture grass.

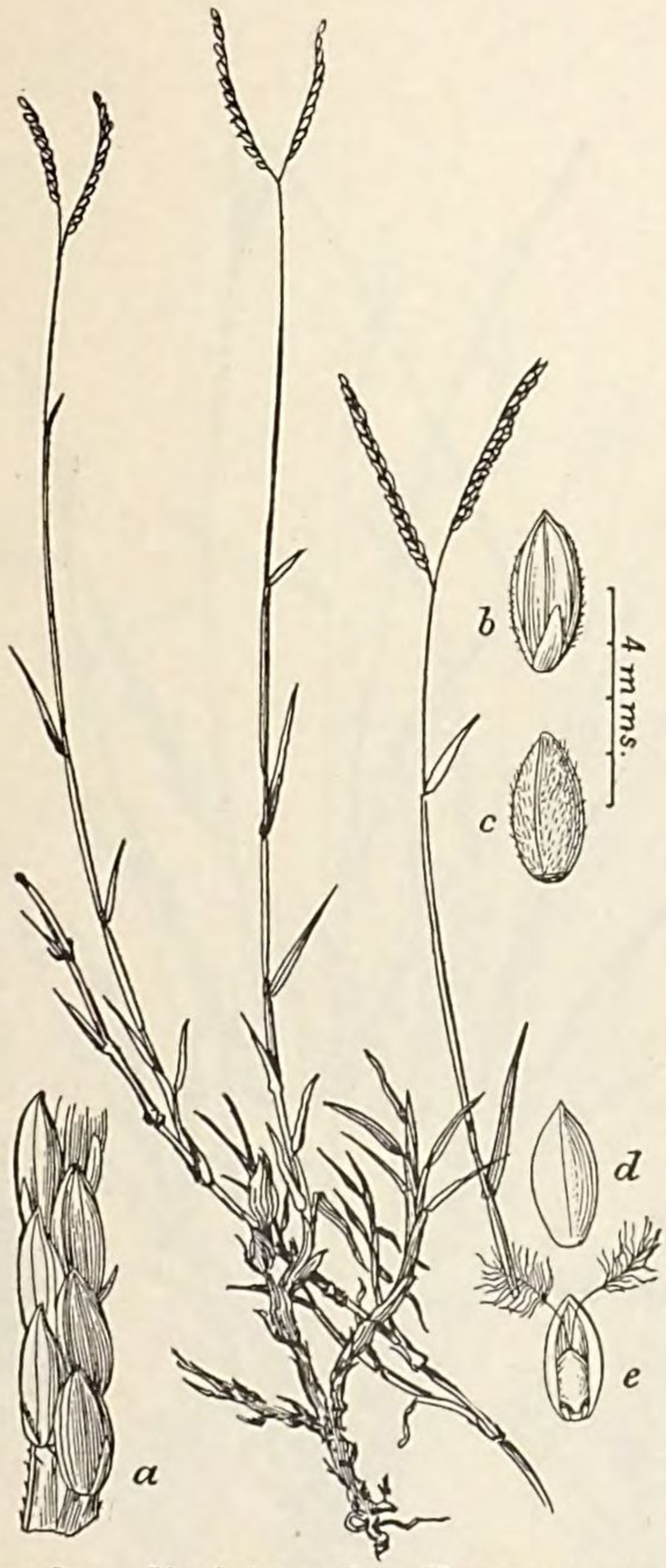

FIG. 25. **Paspalum distichum** L. KNOT-GRASS.—A low, creeping, somewhat succulent perennial, with flat leaves and two spikes at the apex of the upright flower-bearing branches, which are 1 to 3 dm. high. Habit of growth resembling Bermuda-grass.—Ditches and muddy or sandy shores, Virginia and Missouri to Florida, Texas, and southern California; northward on the Pacific Coast to Oregon. [Widely distributed in tropical and subtropical regions.] April–October.

FIG. 26. **Paspalum setaceum** Michx. SLENDER PASPALUM.—A slender, erect, or ascending native perennial, usually about 6 dm. high, with flat, often hairy leaves, and slender, small-flowered spikes.—Dry, sandy fields and pine barrens, Massachusetts to northeastern Nebraska, Texas and Florida. April–October.

FIG. 27. **Paspalum læve** Michx. SMOOTH PASPALUM.—Perennial, with ascending culms, often geniculate at base, 3 to 9 dm. high, with smooth or pilose leaf sheaths and blades, and 3 to 7 spreading spikes 5 to 10 cm. long. Low, often wet, ground, Rhode Island to Florida, eastern Texas and Missouri. June–October.

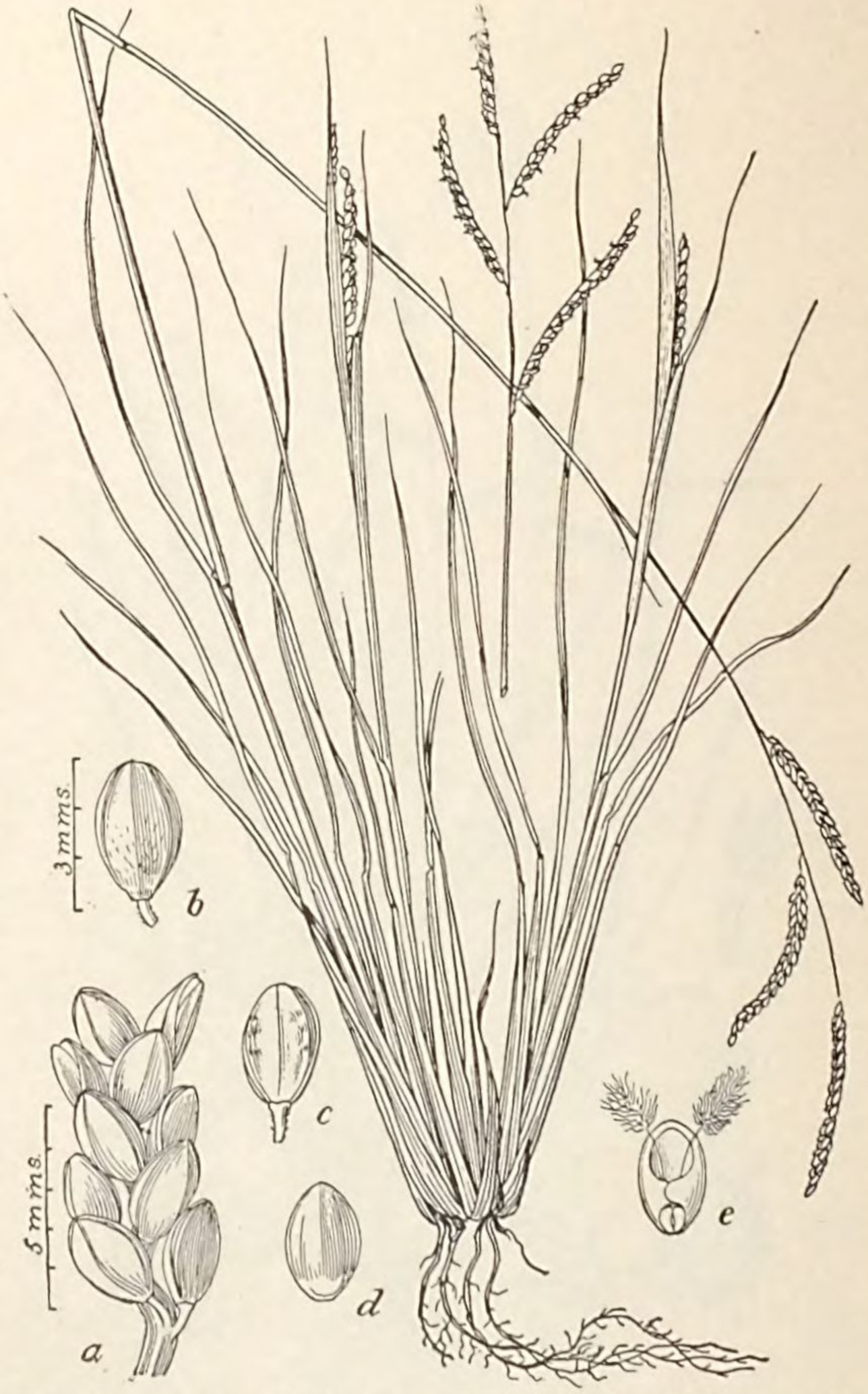

FIG. 28. **Paspalum plicatulum** Michx.; Beal, Grasses N. Am., 2: 90. WRINKLE-FLOWERED PASPALUM.—An erect or ascending perennial 3 to 6 dm. high, with smooth or flat leaves and 5 to 7 rather densely flowered racemes. The second glume is usually plicate or wrinkled.—Dry fields and open pine woods, Georgia and Florida to Texas. [Mexico, Central and South America, and West Indies.] April–October.

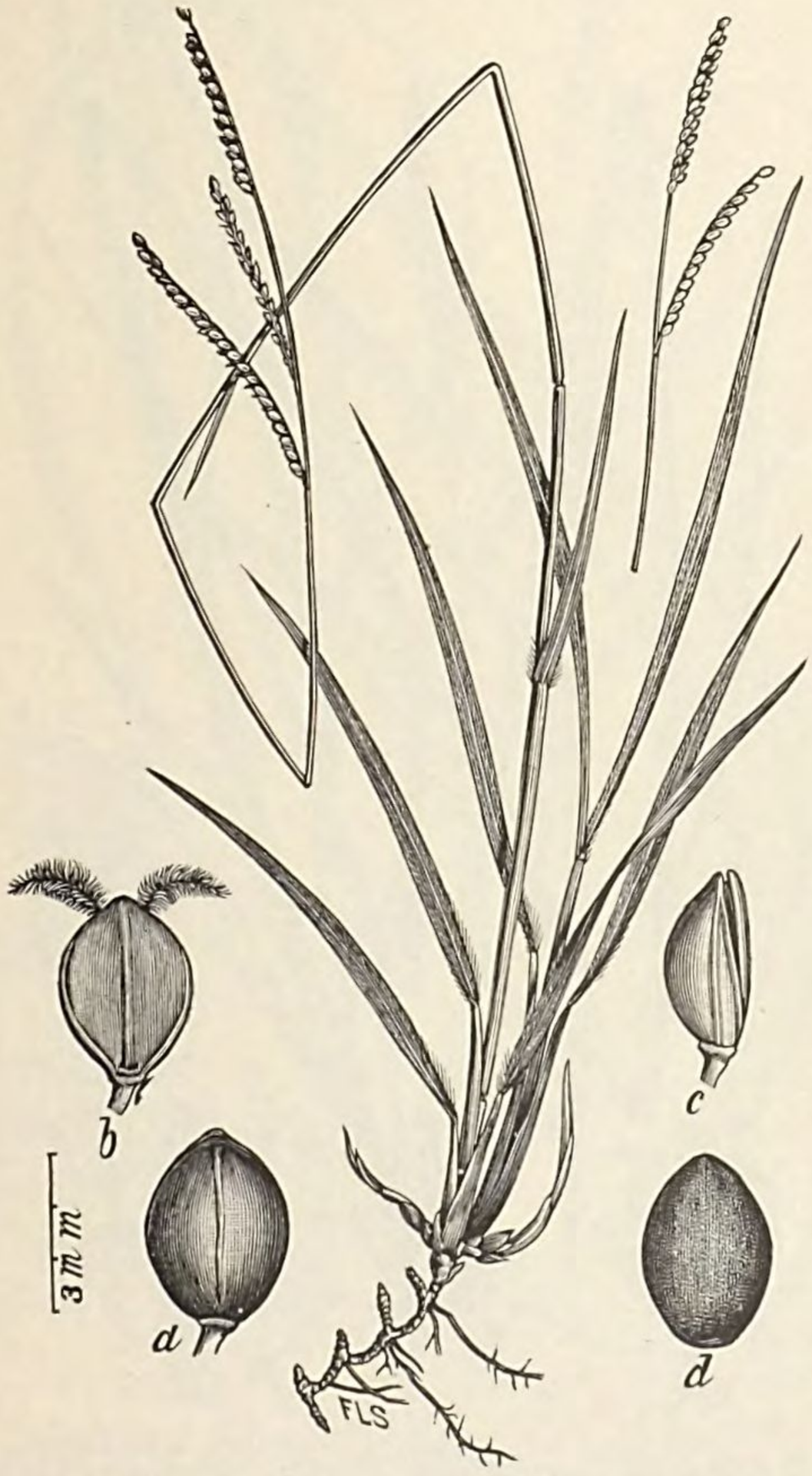

FIG. 29. **Paspalum difforme** Le Conte; Vasey Proc. Acad. Nat. Sci. Phila. 1886, 286.—A stout perennial, from creeping rootstocks. Allied to *P. floridanum*, but less robust, with shorter leaves and spikes.—Dry pine barrens near the coast, North Carolina to Florida and westward to Texas. June–October.

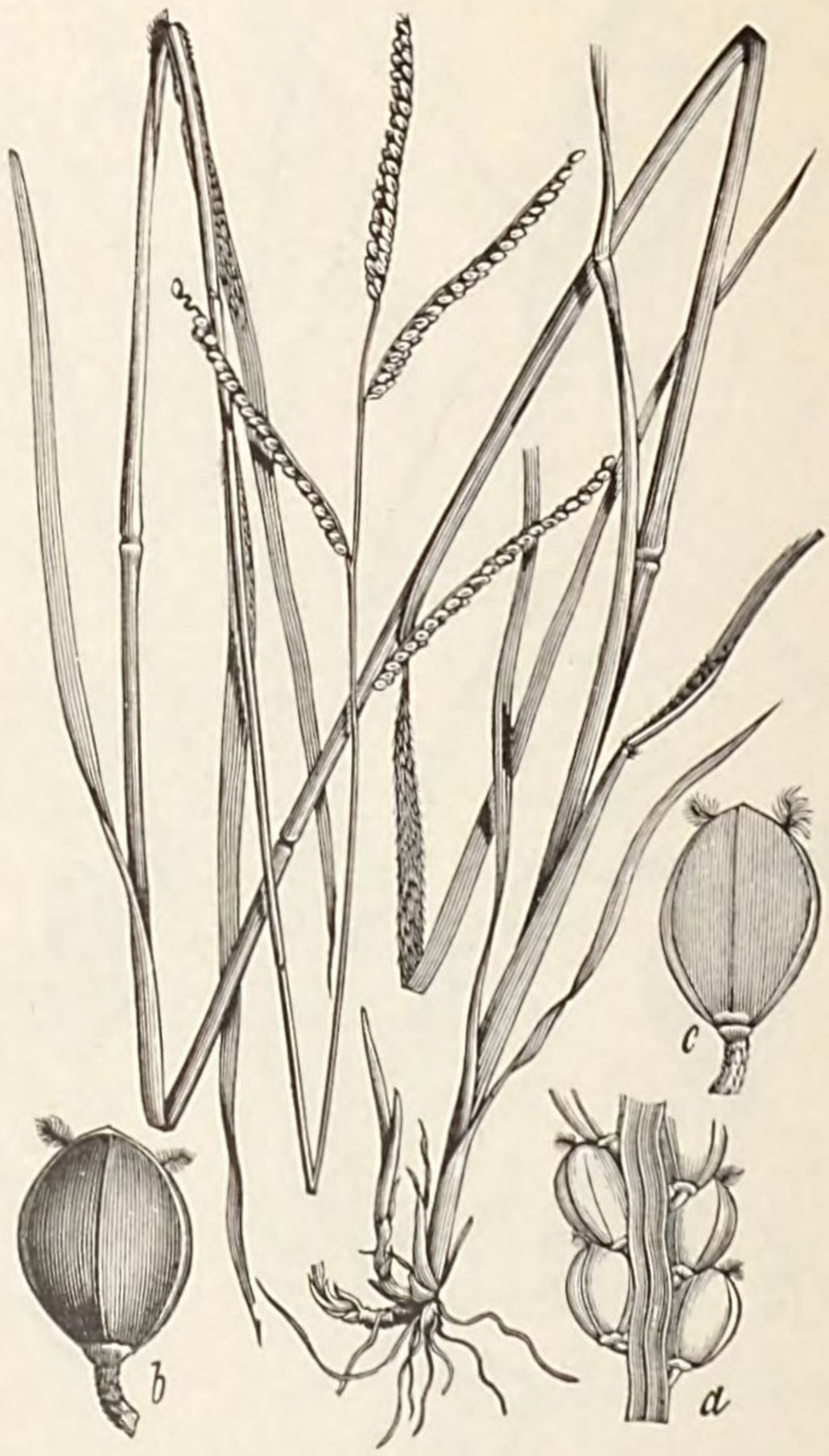

FIG. 30. **Paspalum floridanum** Michx. FLORIDA PASPALUM.—A stout, erect grass 9 to 12 dm. high, often glaucous, with long leaves, smooth or villous sheaths and blades, and large spikelets. Dry or moist low ground, Delaware to Florida, Texas, Kentucky, and Indian Territory. June–October.

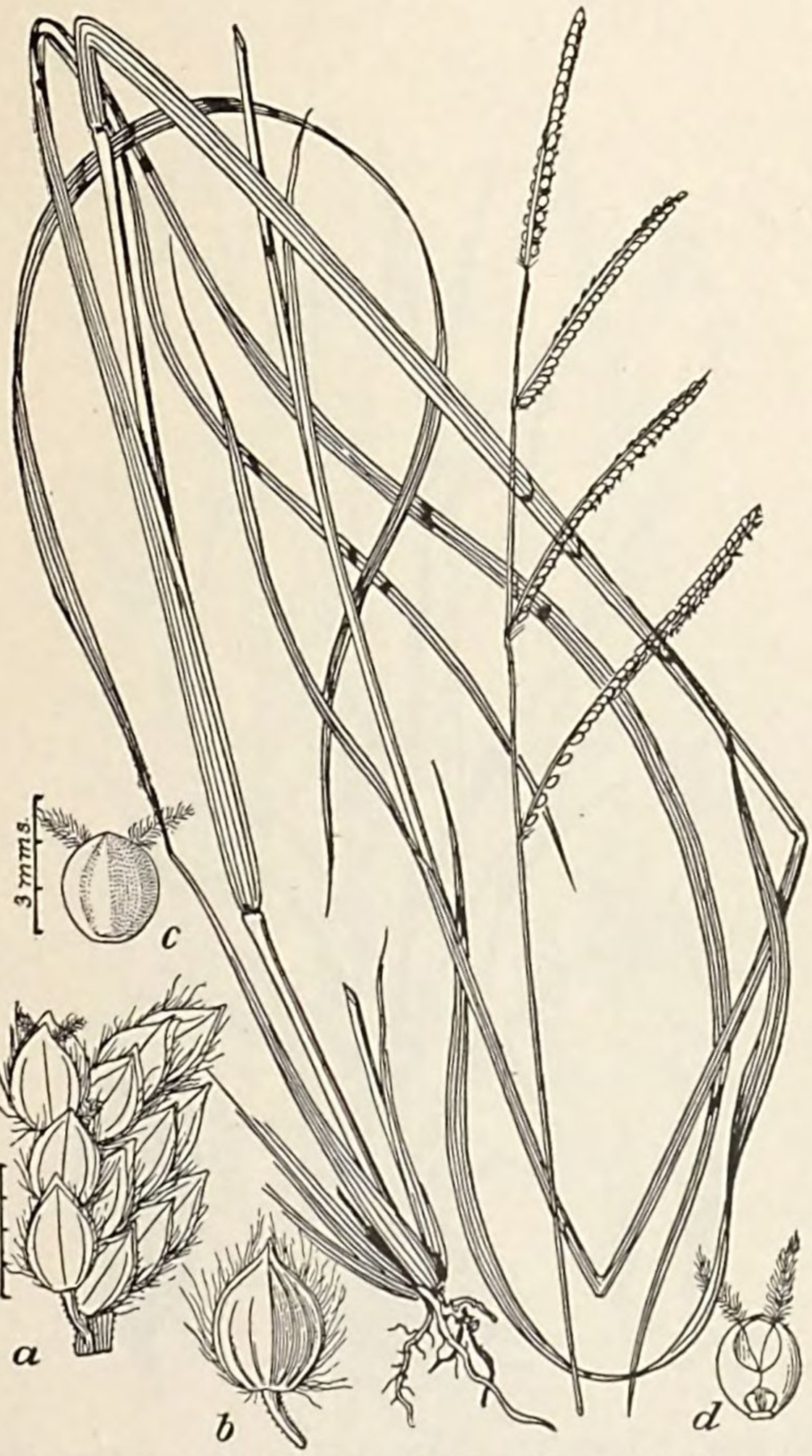

FIG. 31. **Paspalum dilatatum** Poir. (*P. ovatum* Nees). LARGE WATER-GRASS.—A somewhat coarse, leafy perennial, growing in clumps 6 to 15 dm. high, bearing 2 to 10 more or less spreading racemes of hairy spikelets.—In meadows, waste ground, and along ditches, southeastern Virginia to Florida, west to Texas; apparently naturalized. [South America.] July–October.

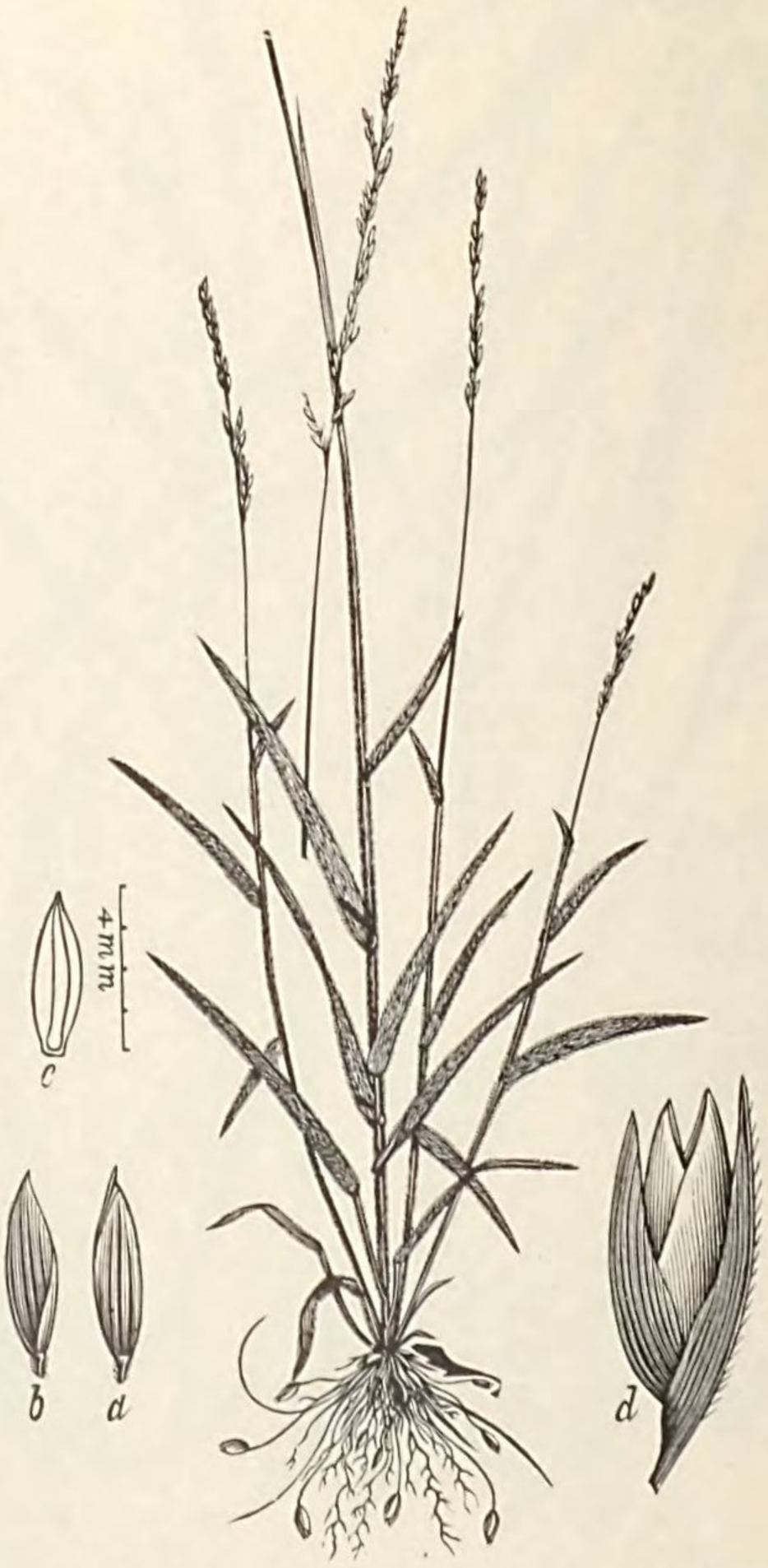

FIG. 32. **Amphicarpon purshii** Kunth. PURSH'S AMPHICARPON.—An erect, tufted perennial 3 to 12 dm. high, with hispid sheaths and leaves and contracted panicles. Fertile spikelets solitary and subterranean.—Pine barrens and cranberry bogs near the coast, New Jersey. August, September.

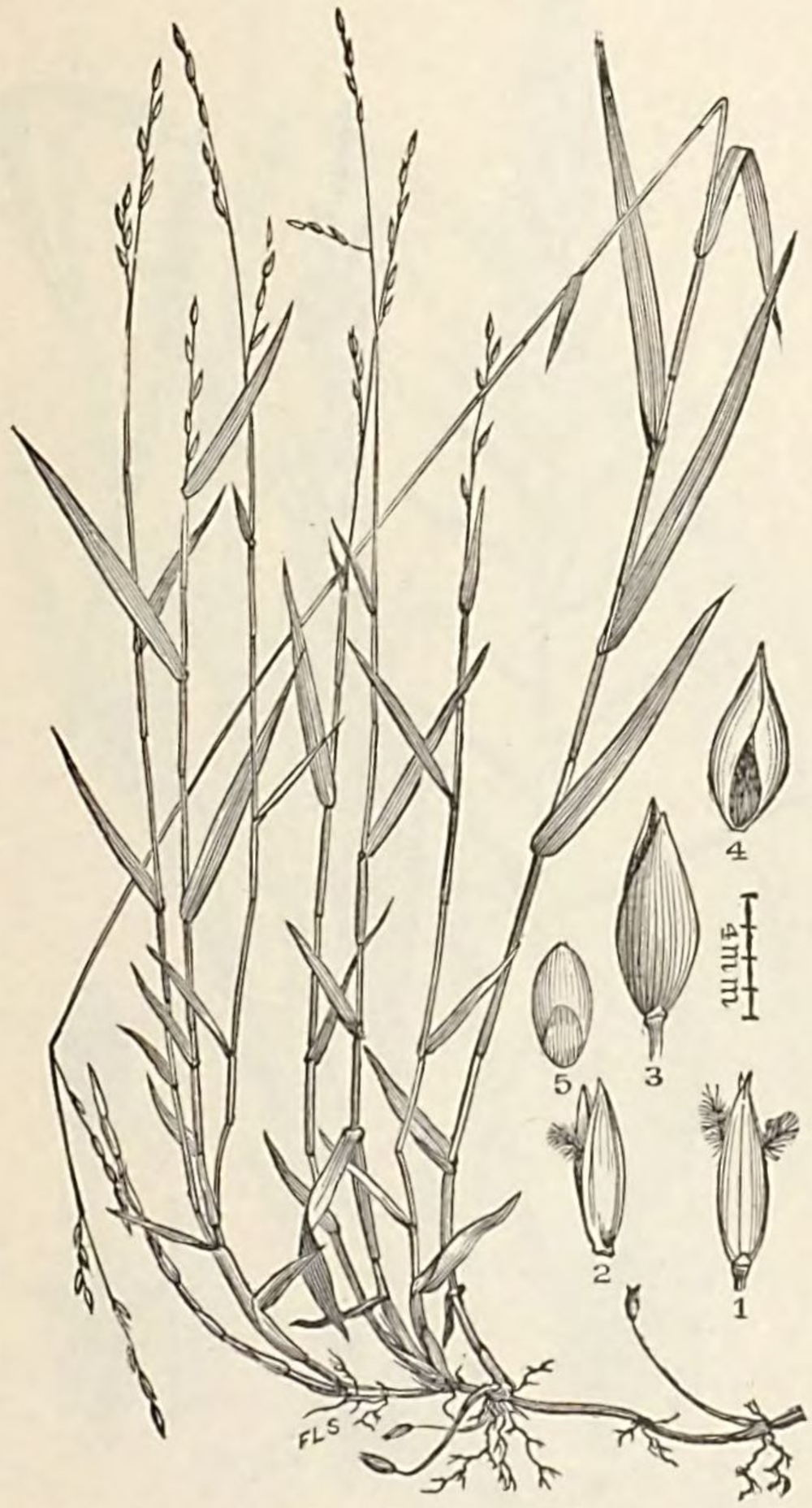

FIG. 33. **Amphicarpon floridanum** Chapm.; Beal, Grasses N. Am., **2**: 100. FLORIDA AMPHICARPON.—A pale-green, smooth perennial 3 to 9 dm. high, from creeping rootstocks, with flat leaves and narrow panicles 10 to 20 cm. long. Fertile spikelets on subterranean branches.—Moist pine barrens and sandy shores, Florida (throughout the State). July-September.

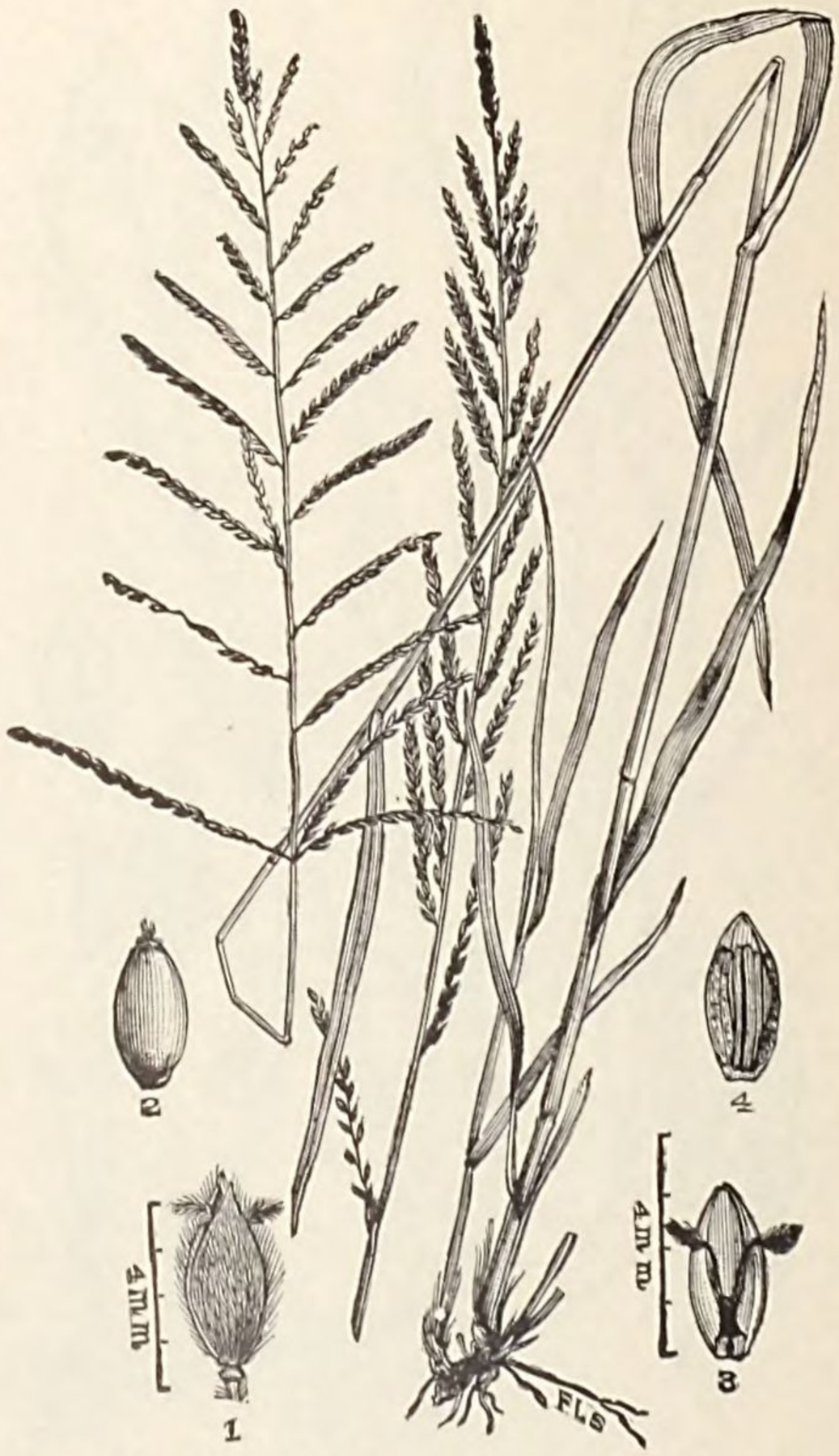

FIG. 34. **Eriochloa mollis** (Michx.) Kunth. (*Panicum molle* Michx.), Beal, Grasses N. Am., **2**: 102. SOFT WOOL-GRASS.—A perennial 10 to 20 dm. high, with long, flat leaves and open panicles of numerous, more or less spreading racemes 3 to 6 cm. long.—Brackish marshes and shores, South Carolina to Florida. April–September.

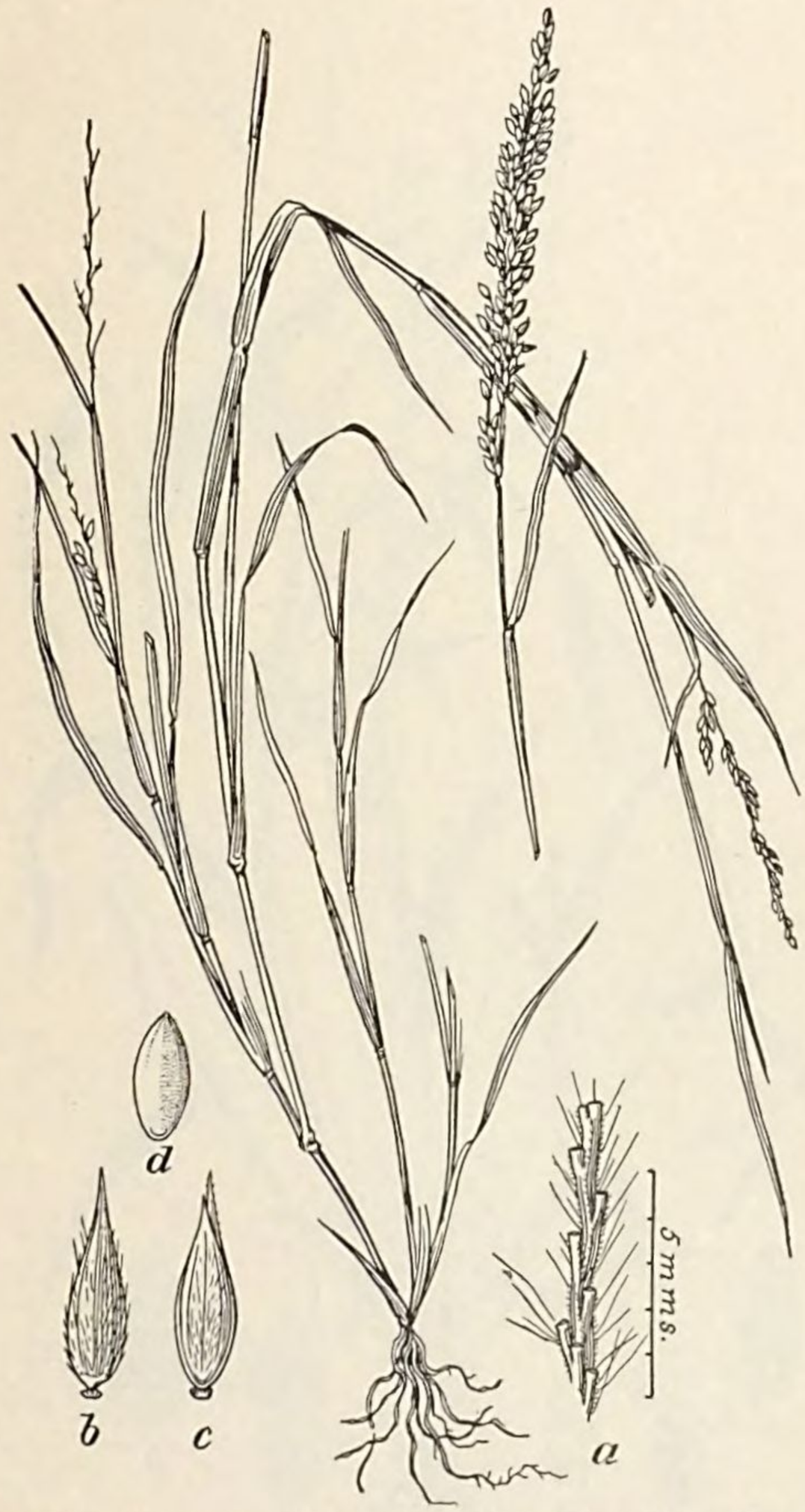

FIG. 35. **Eriochloa punctata** (L.) W. Hamilt. EVERLASTING-GRASS.—A rapid-growing, smooth and somewhat succulent perennial, with more or less branching culms 6 to 12 dm. high, flat leaves and narrow panicles 5 to 10 cm. long.—Low, rich land, moist soil, prairies, etc., Kansas to Texas and Arizona. [Tropical America, Asia, and Australia.] June–September.

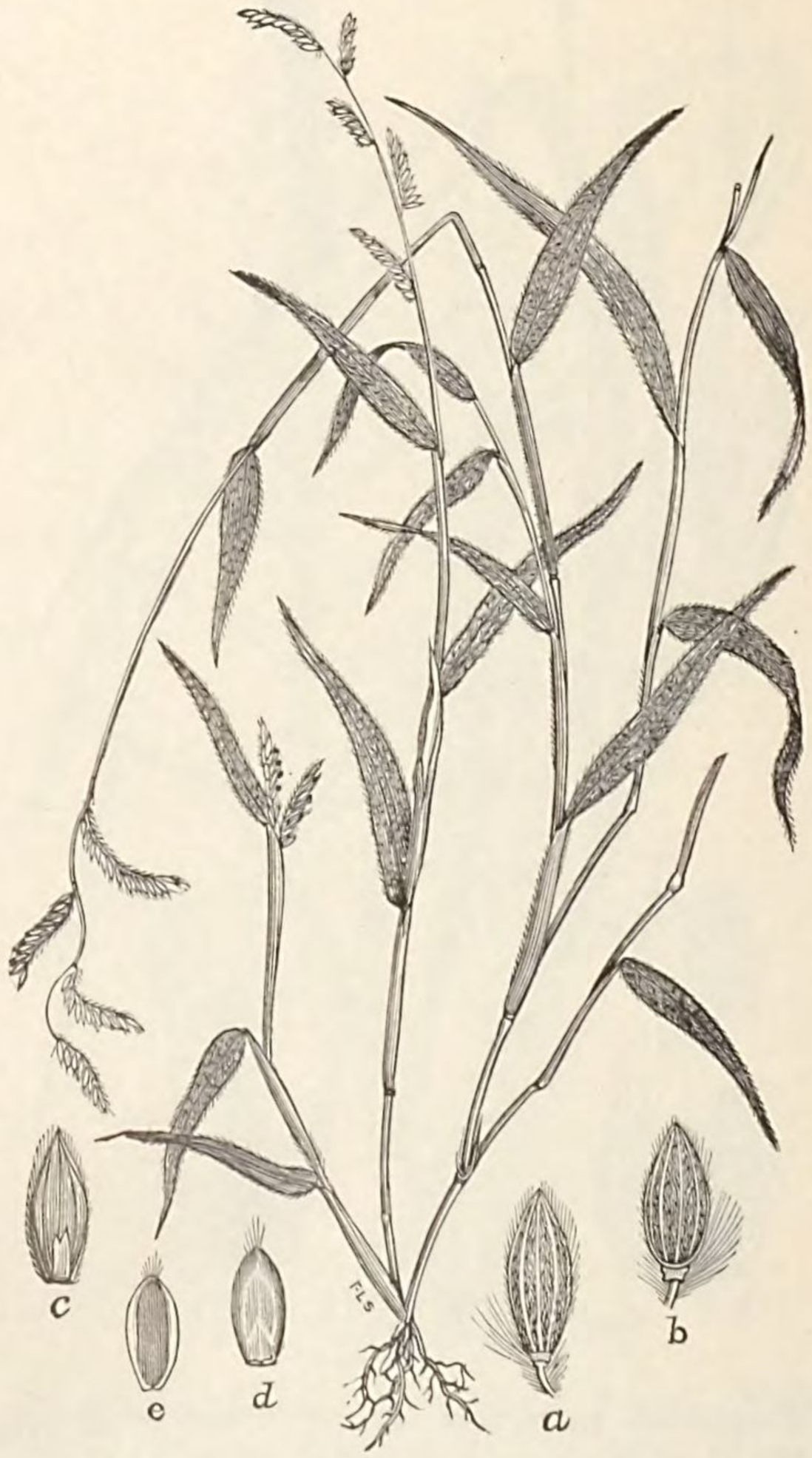

FIG. 36. **Eriochloa lemmoni** Vasey & Scribn.; Beal, Grasses N. Am., **2**: 101. LEMMON'S WOOL-GRASS.—A softly pubescent perennial 3 to 6 dm. high, with rather broad leaves and a short panicle composed of about 6 spreading spikes 2 to 3 cm. long.—**Arizona.** [Northern Mexico.] August–November.

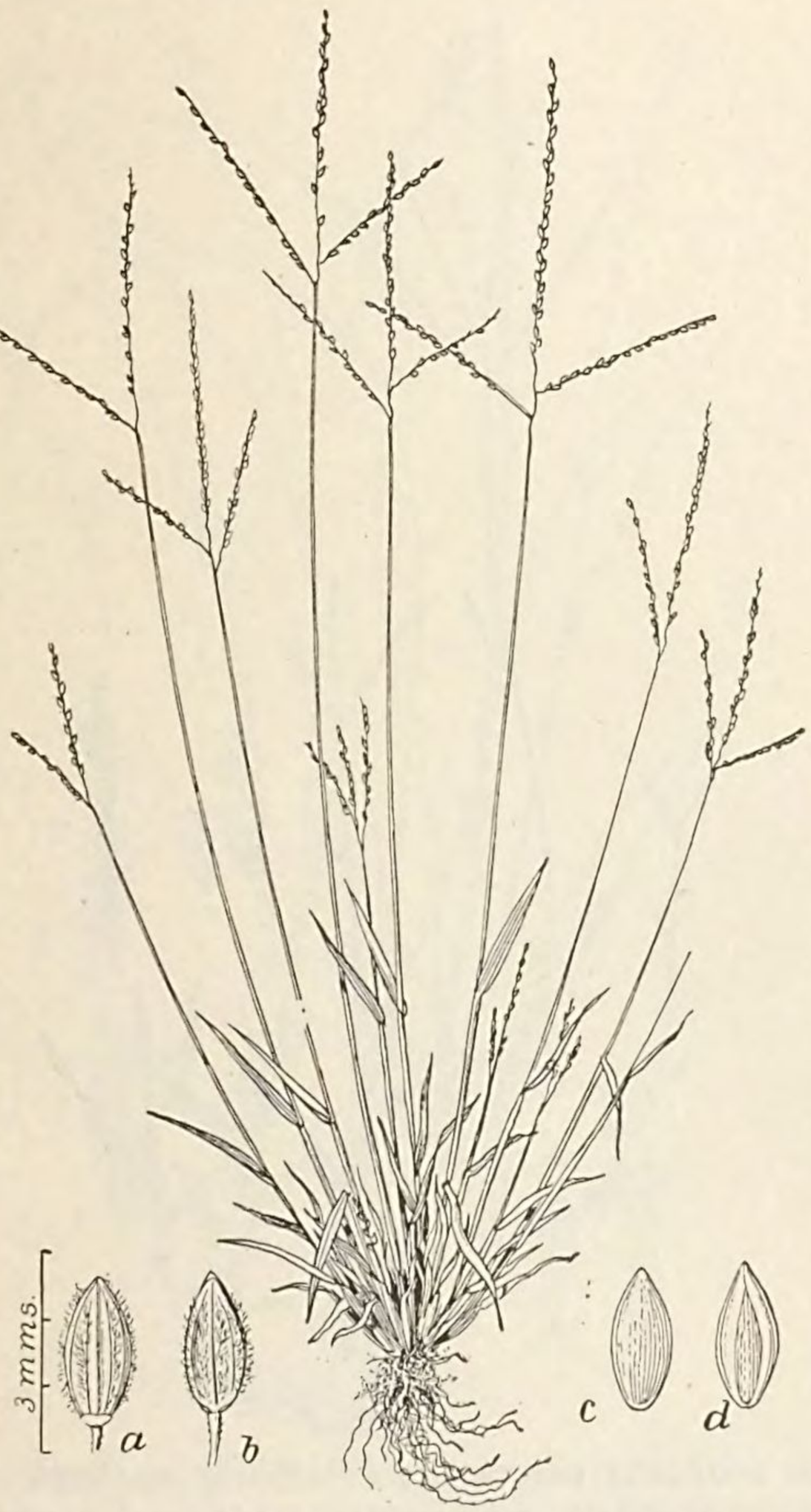

FIG. 37. **Panicum lineare** Krock (*Panicum glabrum* Gaud.; *Syntherisma linearis* Nash). SMOOTH CRAB-GRASS.—A slender, glabrous annual 1.5 to 3.5 dm. high, with culms which are much branched below, flat leaves, and 2 to 6 slender diverging spikes.—Naturalized in waste and cultivated land; Nova Scotia to Ontario and South Dakota, south to Florida and Texas. [Europe.] August–October.

FIG. 38. **Panicum serotinum** (Walt.) Trin. (*Syntherisma serotina* Walt.; *Digitaria serotina* MX.). LITTLE CRAB-GRASS.—An extensively creeping annual or biennial, with flat, hairy leaves, and slender spikes digitate at the apex of the ascending culms, which are 1 to 3 dm. high.—Low, sandy ground, roadsides, pastures, and cultivated fields near the coast, Delaware to Mississippi; on ballast at Philadelphia. June–August.

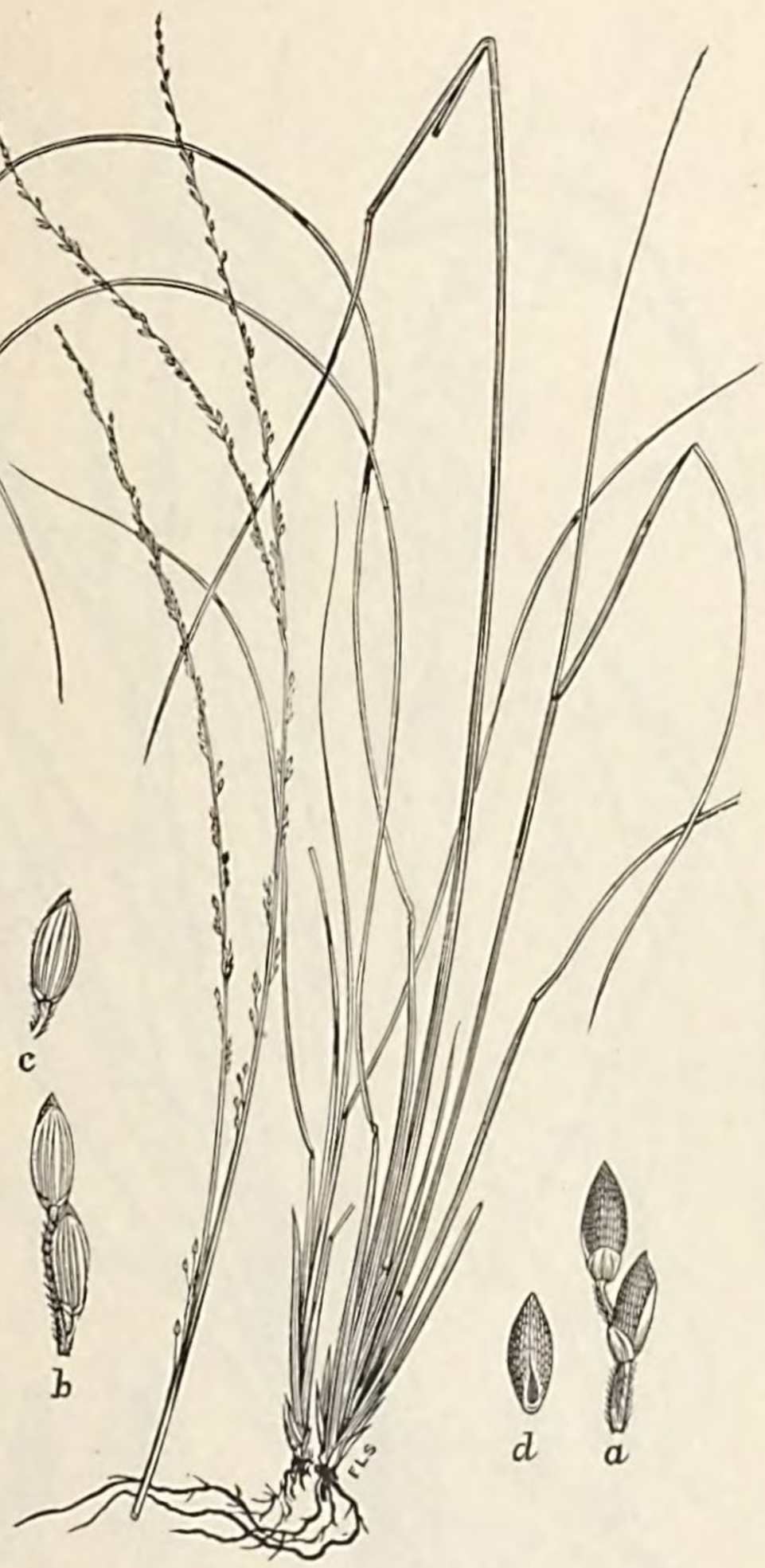

FIG. 39. **Panicum gracillimum** Scribn.; Bull. Torr. Bot. Club, **23**: 146. SLENDER PANICUM.—A slender perennial 3 to 9 dm. high, with very narrow, elongated leaves and small, glabrous spikelets, racemose along the main axis and its branches, which are approximate near the apex of the culm. Outer glumes glabrous.—High pine lands, Lake County, Florida. (1192, Nash.) July.

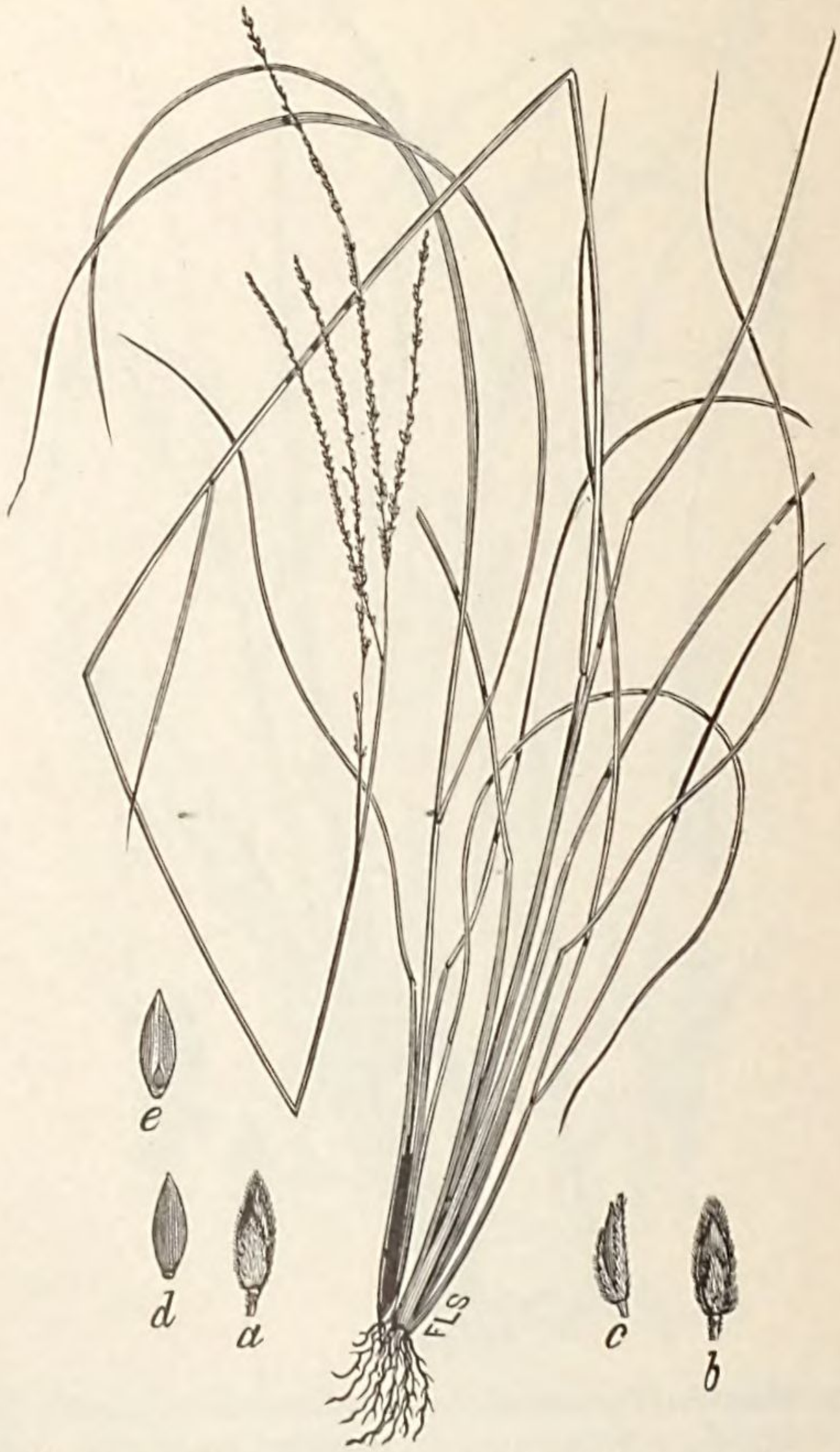

FIG. 40. **Panicum leucocomum** Scribn. (P. phaeothrix in ed. 1). SILVERY PANIC-GRASS.—A slender perennial about 9 dm. high, with long, narrow leaves and very slender, rather loosely flowered racemes 10 to 20 cm. long, approximate near the apex of the clum. Outer glumes densely clothed with soft white hairs.—High pine lands, Florida. (Nash, 1155.) July.

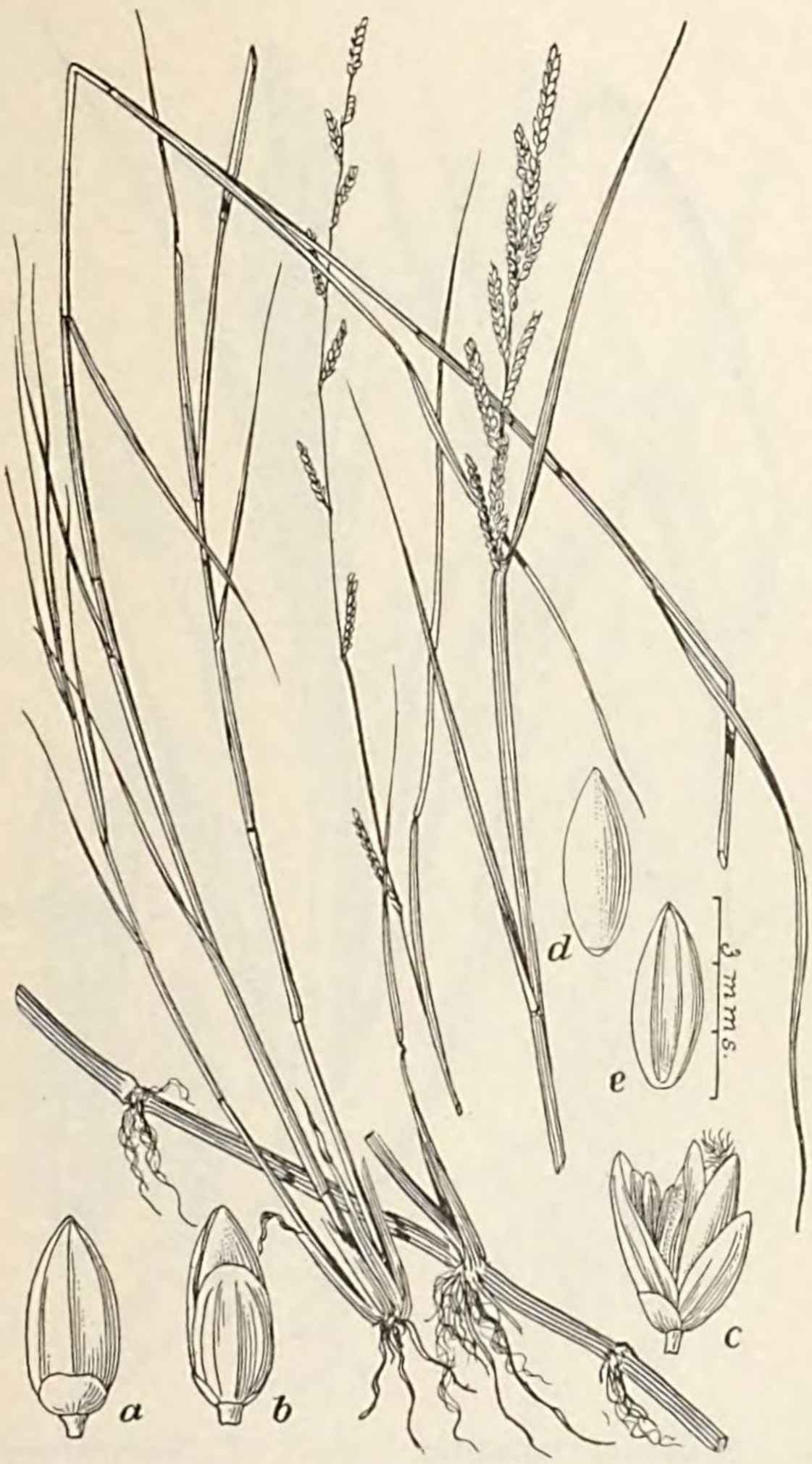

FIG. 41. **Panicum paspaloides** Pers.; Beal, Grasses N. Am., **2**: 114. SOUTHERN WATER-GRASS.—A rather stout, smooth, and more or less branching perennial 6 to 9 dm. high, often creeping at the base, with long, flat leaves, and ten to twenty alternate, one-sided spikes 2 to 3 cm. long.—About ponds and in standing water, southern Florida; Texas. [In tropical countries of both hemispheres.] May–July.

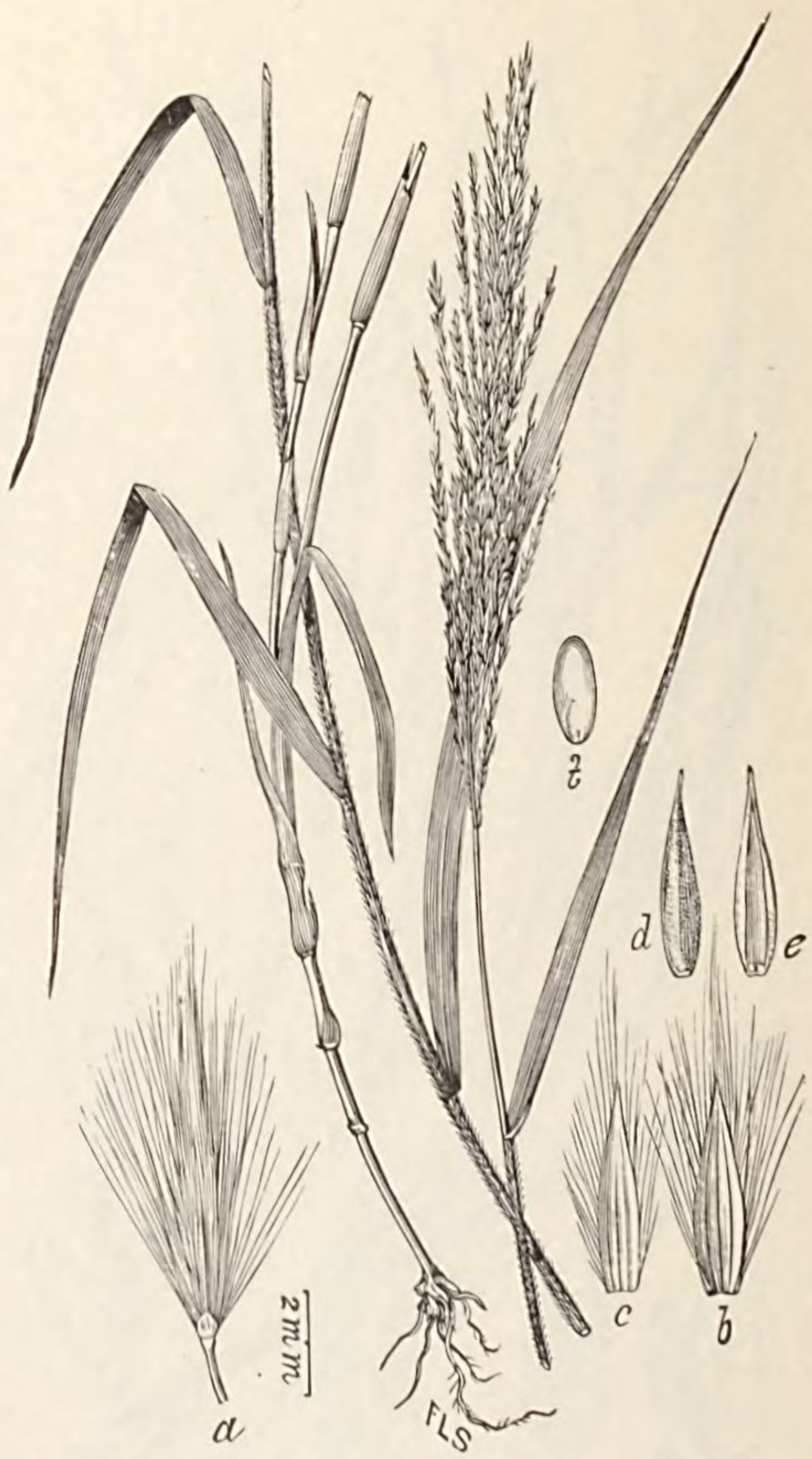

FIG. 42. **Panicum lanatum** Rottb. (*P. leucophæum* HBK.); Beal, Grasses N. Am., **2**: 111. COTTON-GRASS.—A rather stout, more or less branching leafy perennial 6 to 12 dm. high, with narrow, soft-hairy panicles.—Cultivated ground, river banks, and coral soil on keys, central and southern Florida; on ballast at Mobile, Ala. [Widely distributed in tropical America; Australia; Africa.] May–October.

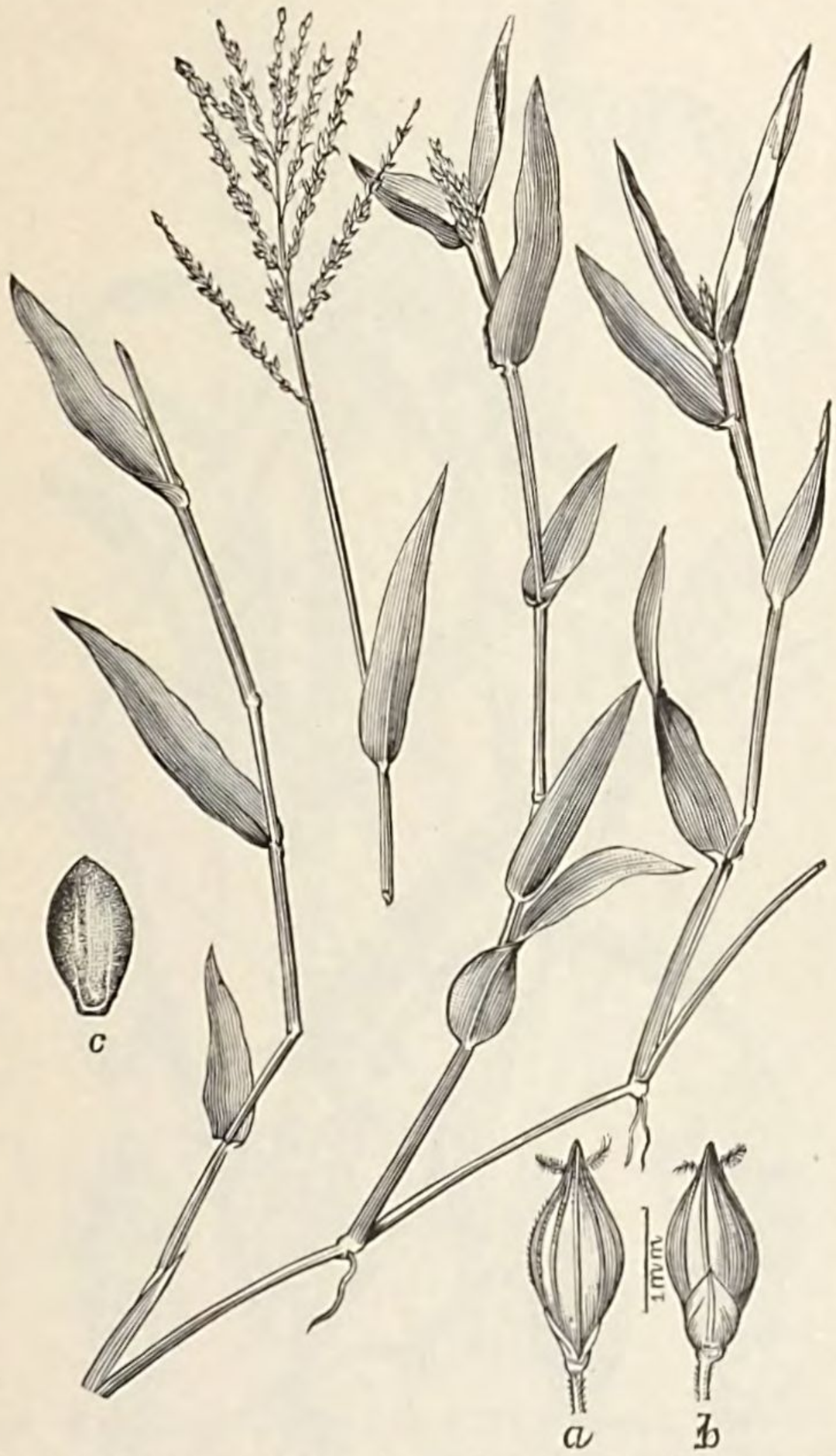

FIG. 43. **Panicum grossarium** L.; Beal, Grasses N. Am., **2**: 116. JAMAICA CRAB-GRASS.—Apparently an annual, with much-branched, ascending culms 3 to 6 dm. long, broad, lanceolate leaves and spreading panicles of a few simple racemes of glabrous spikelets.—Ballast ground, Philadelphia. Adventive. [West Indies.] September. Cultivated in grass garden, and apparently valuable.

FIG. 44. **Panicum texanum** Buckl.; Beal, Grasses N. Am., **2**: 117. TEXAS MILLET.—A branching, leafy annual 6 to 12 dm. high, with flat leaves and narrow panicles 1.5 to 2 dm. long.—Texas. September.

FIG. 45. **Panicum obtusum** HBK.; Beal, Grasses N. Am., **2**: 115. VINE MESQUITE-GRASS.—Stoloniferous perennial, the runners often 24 to 30 dm. long; the upright flowering branches 3 to 6 dm. high. Panicle of three to five erect racemes, bearing rather large obtuse spikelets.—Irrigated lands, low valleys, chiefly in the shade of trees and shrubs, Kansas and Colorado to Texas, New Mexico, Arizona, and southward. June-September.

FIG. 46. **Panicum stenodes** Griseb. (*P. anceps strictum* Chapm.); Beal, Grasses N. Am., **2**: 126. SMALL-JOINTED PANIC-GRASS.—A slender, erect, glabrous perennial, with wiry stems 5 to 8 dm. high, rigid, involute leaves, and narrow, simple panicles 4 to 8 cm. long.—Moist, sandy pine barrens near the coast, Florida to Texas. [Cuba and San Domingo.] July–October.

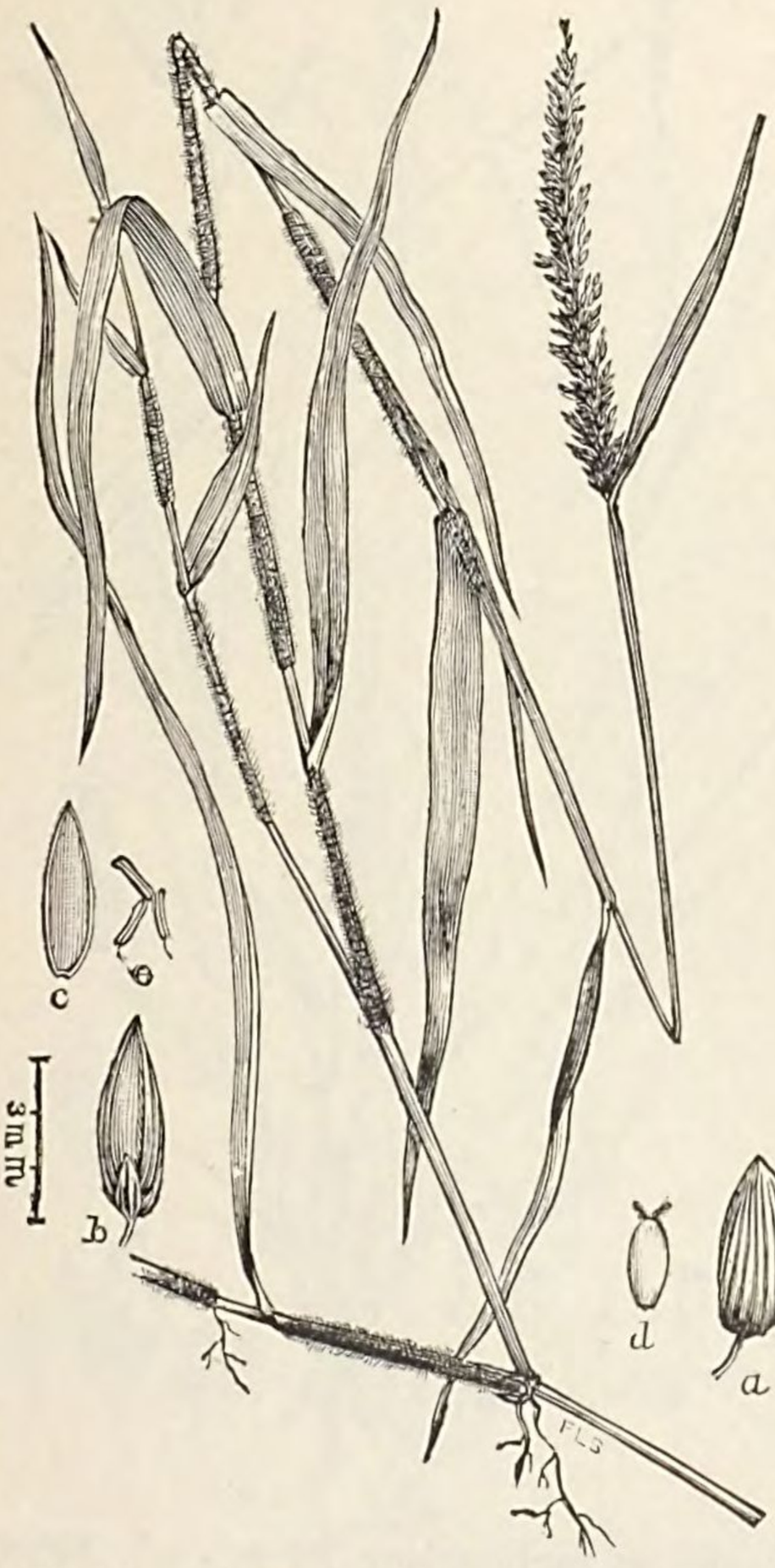

FIG. 47. **Panicum gibbum** Ell. GIBBOUS PANIC-GRASS.—A stoloniferous, branching perennial 3 to 9 dm. high, with narrowly lanceolate, flat leaves, and densely flowered spike-like panicles 10 to 15 cm. long.—Low, wet grounds, Virginia to Florida, Tennessee, Louisiana, and Indian Territory. [Cuba.] June–October.

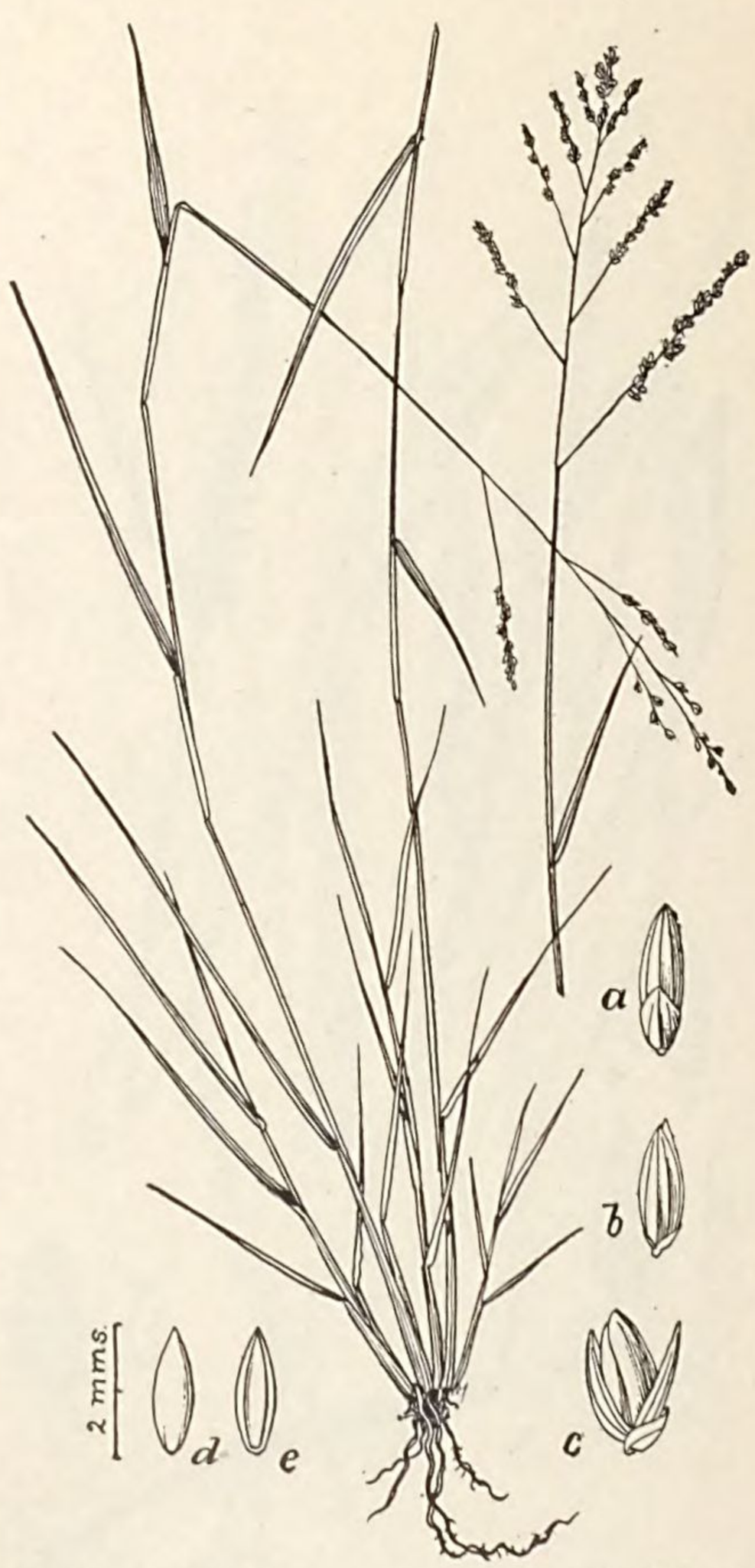

FIG. 48. **Panicum melicarium** Michx. (*P. hians* Ell.); Beal, Grasses N. Am., **2** : 127.—A smooth, slender, usually erect perennial 2 to 5 dm. high, with narrow, flat leaves and simple, open panicles 6 to 15 cm. long.—Moist pine barrens and marshes, North Carolina to Florida, Missouri, Indian Territory, and Texas. March–October.

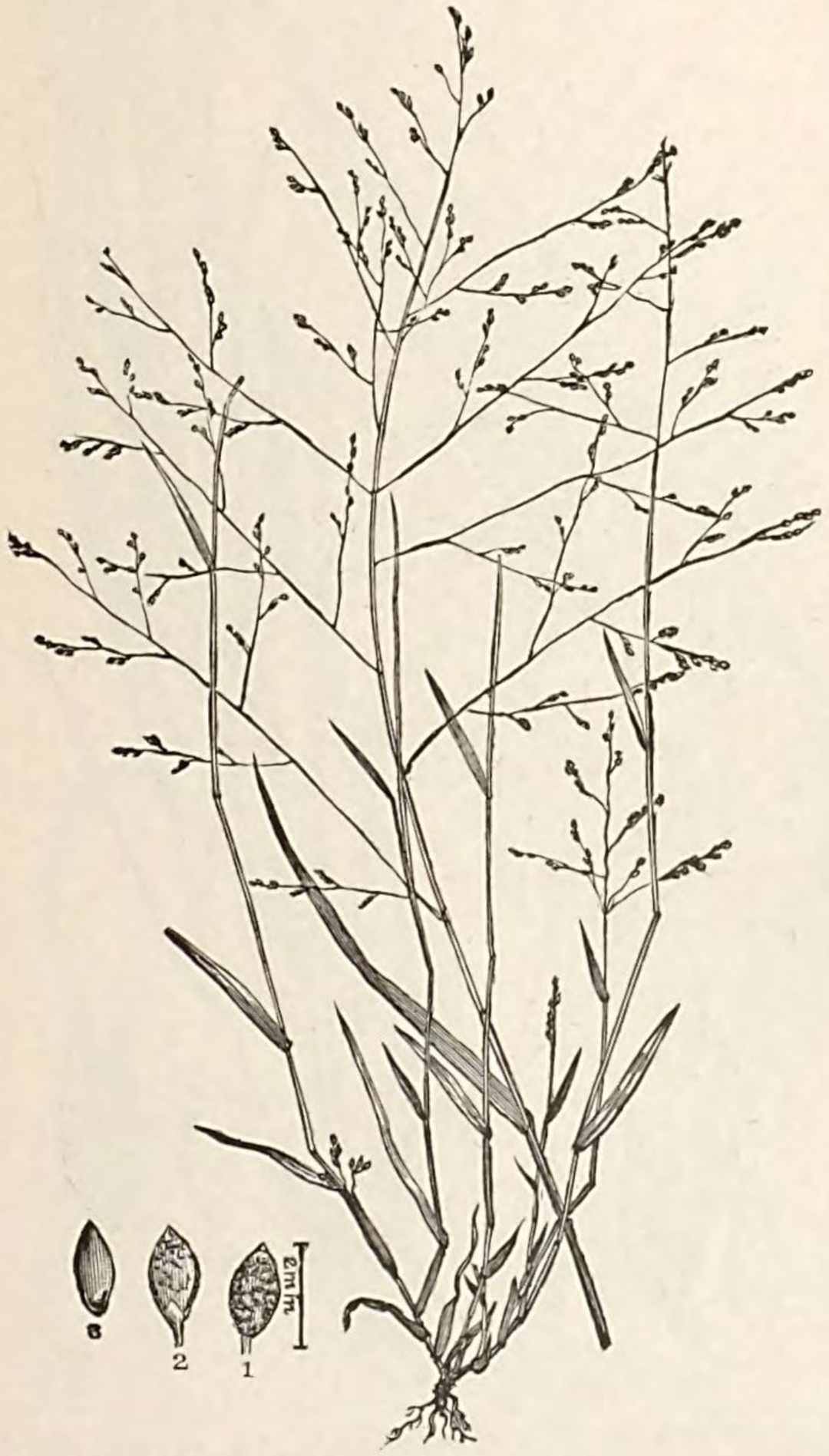

FIG. 49. **Panicum verrucosum** Muhl. WARTY PANIC-GRASS.—A slender, branching perennial, with flat leaves and few-flowered spreading panicles 7.5 to 20 cm. long.—Low, rich woodlands, mostly near the coast, New England to Florida, west to Tennessee and Louisiana. May–October.

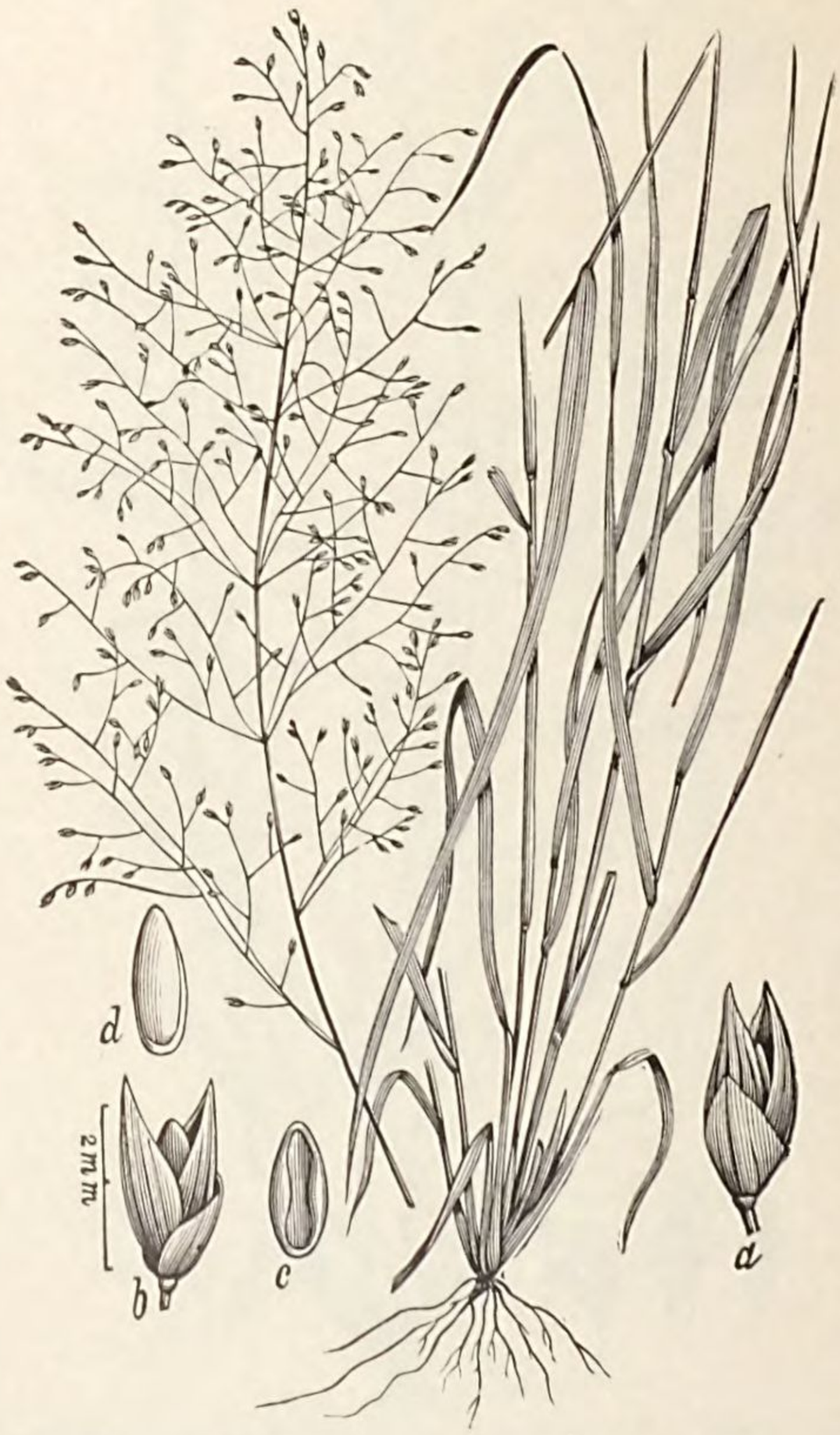

FIG. 50. **Panicum filipes** Scribn. in Heller, Contrib. Herb. Franklin & Marshall Coll., **1** : 13 (1895).—A slender, more or less branching and leafy, glaucous annual (?) 3 to 7 dm. high, with rather long, flat leaves and diffuse capillary panicles 15 to 30 cm. long.—Dry grounds, western Texas and (?) Mexico. May–July.

FIG. 51. **Panicum proliferum** Lam. SPROUTING CRAB-GRASS.—A smooth and usually much-branched, native annual, with rather coarse, spreading, or ascending stems 6 to 18 dm. long, flat leaves and diffuse terminal and lateral panicles.—Low ground, ditches, etc., Maine to Illinois and Nebraska, south to Florida and Texas. [Cuba]. March–October.

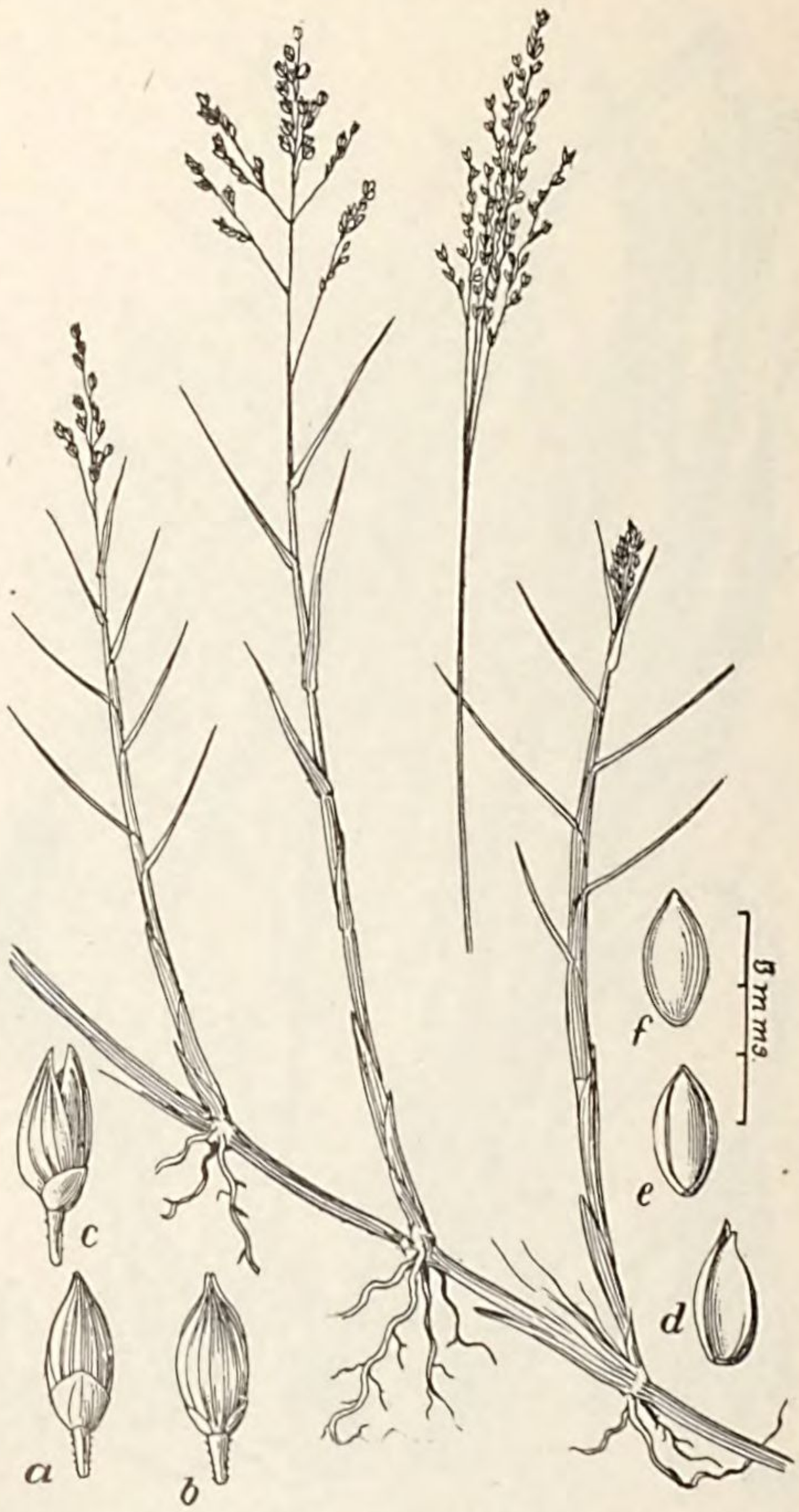

FIG. 52. **Panicum repens** L.; Beal, Grasses N. Am., **2**: 127. CREEPING PANIC.—An extensively creeping, maritime grass, with rather stiff leaves and rigid, upright, flowering stems or branches 2 to 5 dm. high.—Sea beaches, southern Alabama to Louisiana. [Tropical and subtropical coasts of both hemispheres.] A good sand-binder.

FIG. 53. **Panicum anceps** Michx. FLAT-STEMMED PANIC.—A rather stout perennial, with flattened stems 6 to 12 dm. high, long leaves, smooth or pilose sheaths, spreading panicles and pointed spikelets.—Low woods and thickets, marshes and banks of streams, Pennsylvania to Illinois, Missouri, Indian Territory, Texas, and Florida. July–October.

FIG. 54. **Panicum virgatum** L. SWITCH-GRASS.—A stout, erect perennial 9 to 15 dm high, usually forming large tufts, with strong, creeping rootstocks, long, flat leaves, and ample, spreading panicles.—Sandy soil, usually along streams and about ponds and lakes, Maine and Ontario to North Dakota, Colorado, Arizona, Texas, and Florida. [Mexico.] July–October.

FIG. 55. **Panicum amarum** Ell. BITTER PANIC-GRASS.—A stout, coarse perennial 3 to 12 dm. high, from strong, creeping rootstocks, with rather long (30 to 40 cm.), rigid leaves and many-flowered, open panicles 10 to 30 cm. long.—Sandy beaches, coast of southern New England to southern Florida. July–November. A good sand binder.

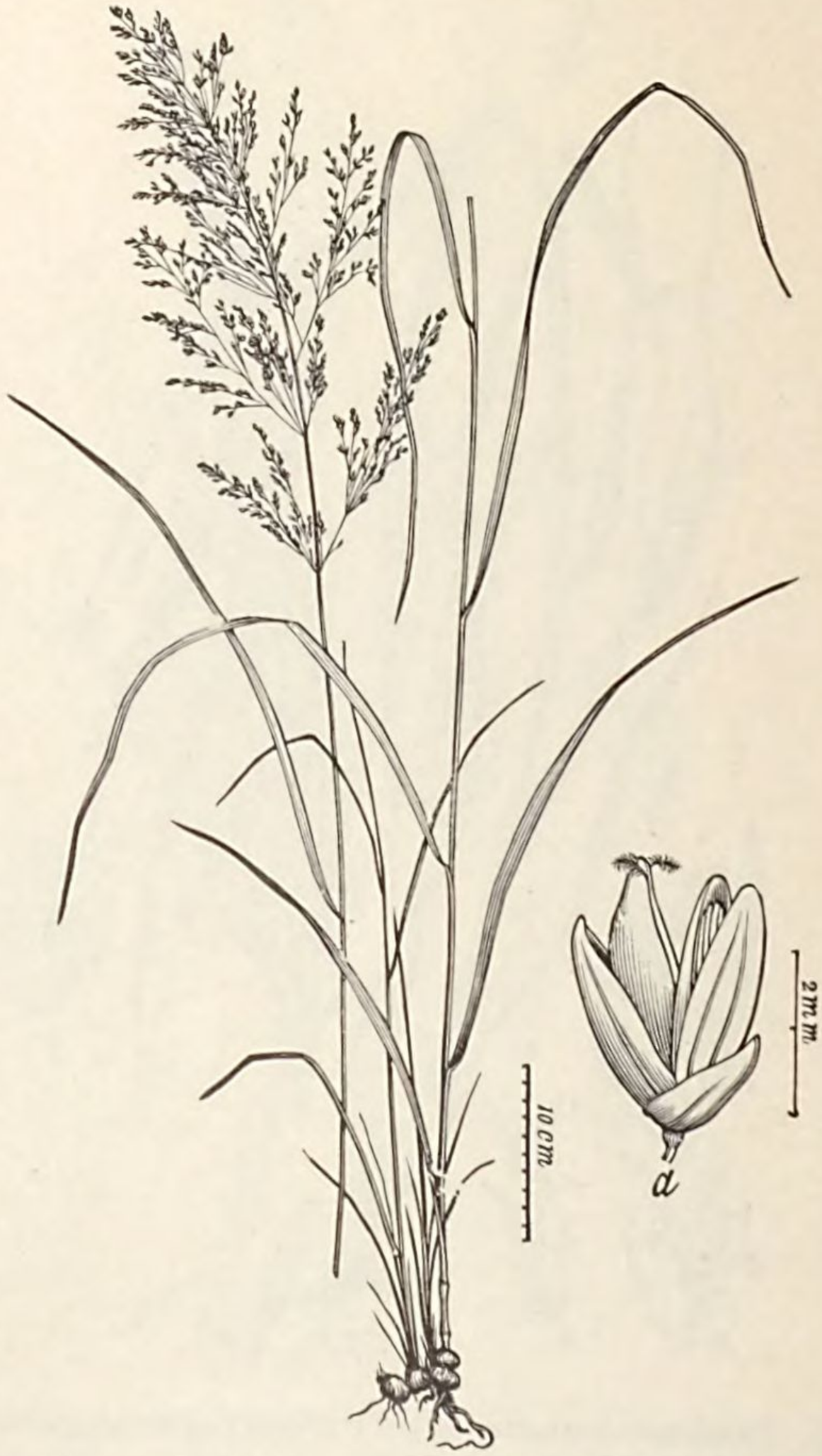

FIG. 56. **Panicum bulbosum** HBK.; Beal, Grasses N. Am., **2**: 131. ALKALI SACCATONE.—A stout, glabrous perennial 9 to 12 dm. high, from a bulbous base, with flat leaves and usually ample panicles 20 to 40 cm. long.—In canyons, Texas to Arizona. [Mexico.] June-September. A valuable hay grass for alkaline soils.

FIG. 57. **Panicum sphærocarpon** Ell.; Britton and Brown, Ill. Fl., **1**: 116. ROUND-FLOWERED PANIC.—A tufted, erect, or ascending perennial 25 to 60 cm. high, with rather broad, firm, and nearly erect leaf blades, diffuse many-flowered panicles and small, rounded spikelets.—Dry or moist woods and fields, Maine to southern Ontario, Wisconsin, Indian Territory, Texas, and Florida. [Mexico and Guatemala.] May–October.

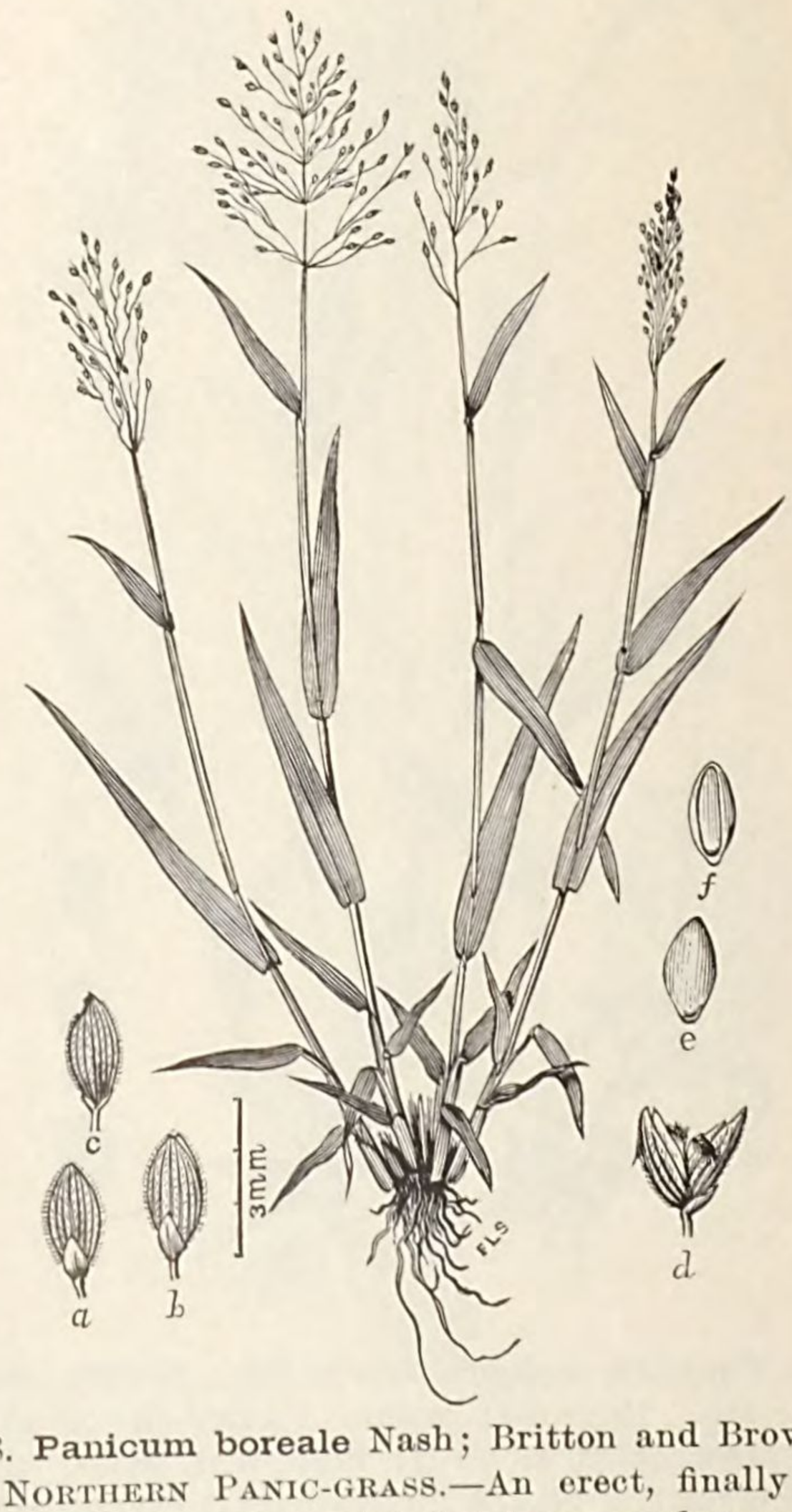

FIG. 58. **Panicum boreale** Nash; Britton and Brown, Ill. Fl., **1**: 119. NORTHERN PANIC-GRASS.—An erect, finally branching perennial 3 to 6 dm. high, with flat leaves and open, spreading panicles 4 to 8 cm. long.—Damp soil, Newfoundland and Ontario to Maine, New York, and Minnesota. **June–August.**

FIG. 59. **Panicum barbulatum** Michx. BEARDED-JOINT.—Culms 3 to 9 dm. high, finally much-branched, slender, smooth, except the nodes, which are conspicuously barbed with reflexed, white hairs, panicle ovate-pyramidal, spikelets numerous, small.—Bogs, wet meadows, and low woodlands, southern New York to Illinois, Florida, and New Mexico.

FIG. 60. **Panicum columbianum** Scribn. sp. nov. AMERICAN PANIC-GRASS.—A slender, erect, much-branched, glabrous perennial, with short (usually 3 to 4 cm. long), lanceolate, ascending, acute leaves, and small-flowered, diffuse, oblong or subpyramidal panicles. Spike-lets about 2 mm. long. Branches finally erect, numerous, flower-bearing.—Dry, sandy fields, meadows, and open woodlands, New England southward to the Carolinas, and westward to Tennessee and Alabama, mostly near the coast; also in California. June–August.

FIG. 61. **Panicum nashianum** Scribn. sp. nov. (allied to *P. demissum* Trin.). NASH'S PANIC-GRASS.—A slender and finally much-branched, leafy perennial 1 to 3.5 dm. high, with flat and rather short leaves, which are ciliate on the margins toward the base, and open pyramidal panicles, the flexuose branches widely spreading or reflexed. (4,029 Curtiss (1893), and 466 Nash (1894).)—Low pine barrens, often in moist ground, near the coast, Virginia to Mississippi. [Brazil.] March–October.

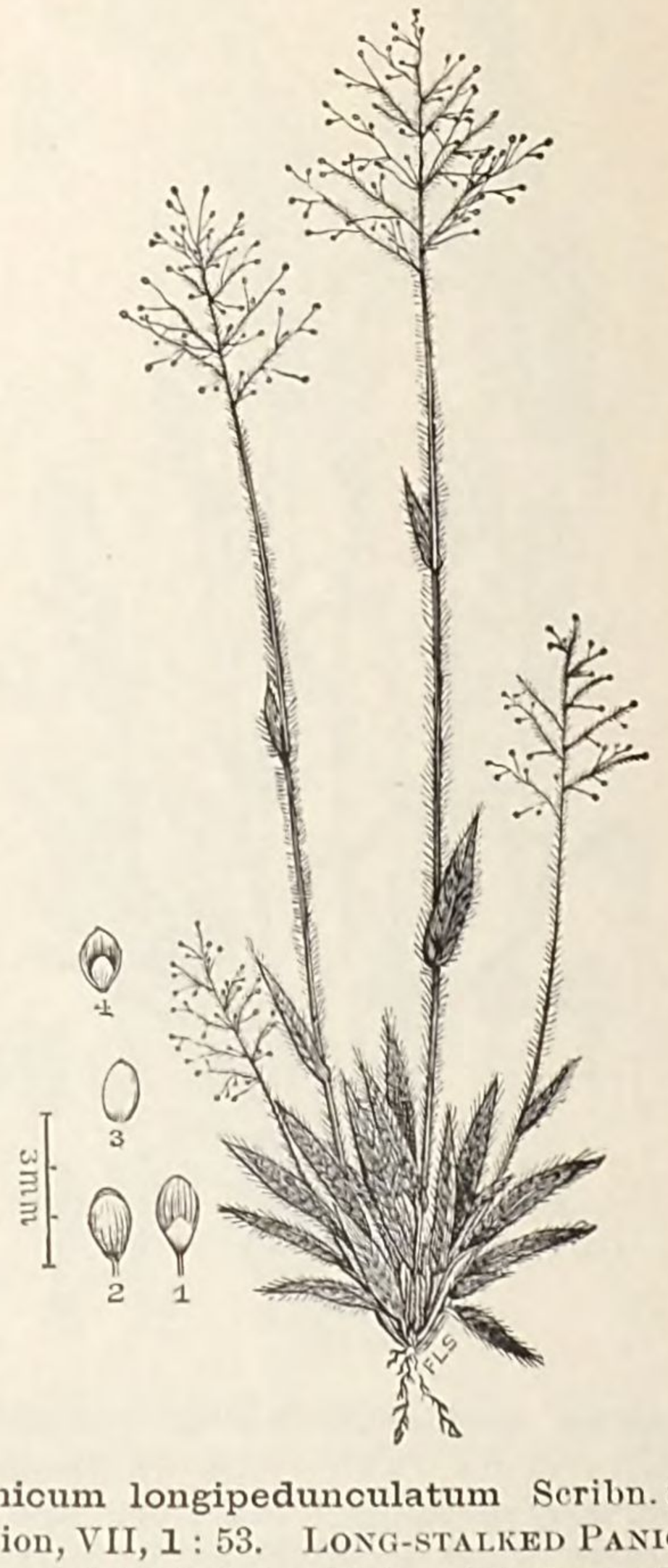

FIG. 62. **Panicum longipedunculatum** Scribn.; Bull. Tenn. Agr. Exp. Station, VII, 1 : 53. LONG-STALKED PANIC.—A slender, cæspitose perennial 1.5 to 3 dm. high, with short, chiefly radical, pilose leaves and diffuse, small-flowered, long-exserted, hairy panicles.—Dry or moist pine barrens and damp woods, apparently rare, eastern Tennessee to eastern North Carolina and Florida. May–August.

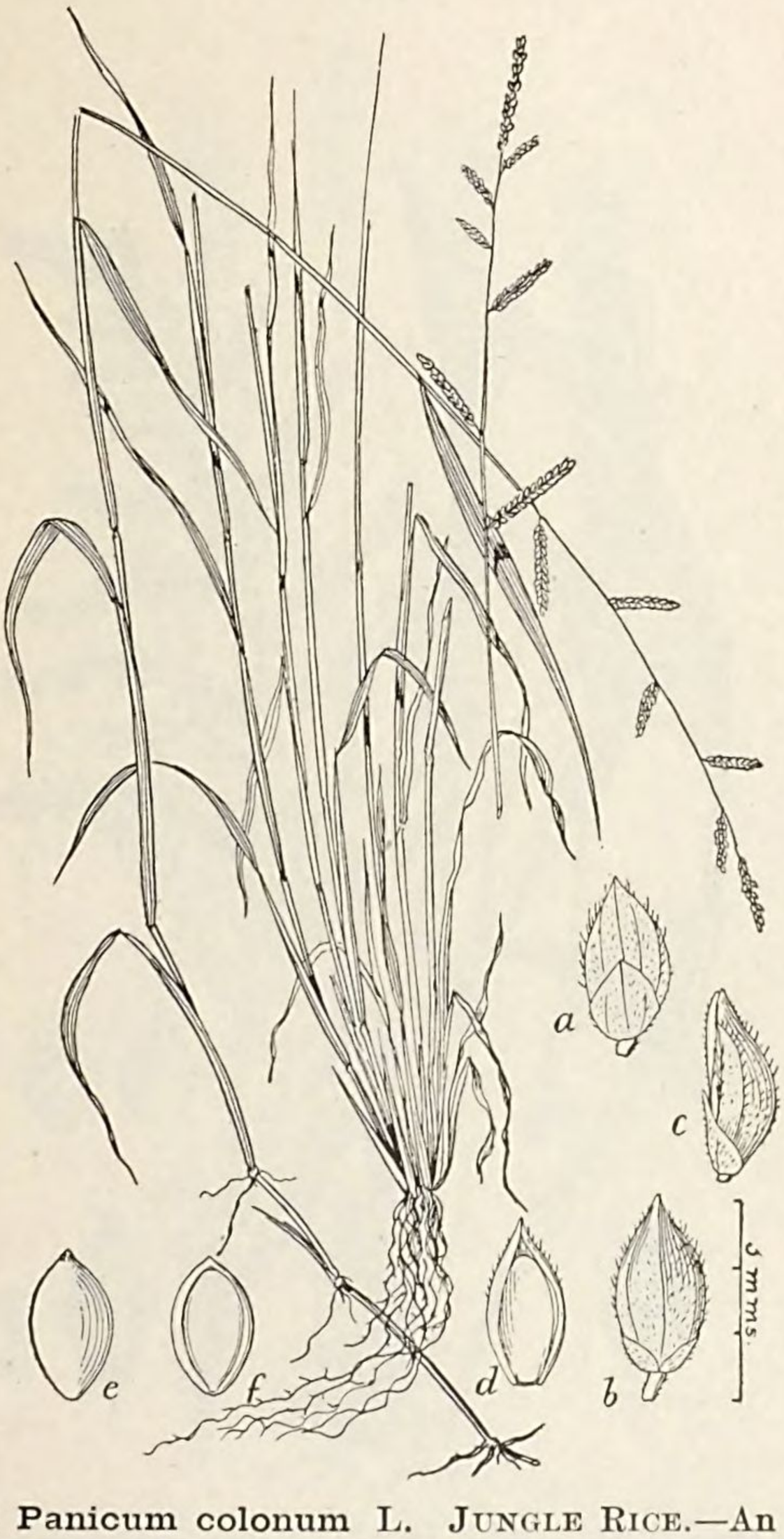

FIG. 63. **Panicum colonum** L. JUNGLE RICE.—An erect or ascending, more or less branching annual 3 to 6 dm. high, with flat leaves and five to ten, densely flowered, one-sided spikes, 1 to 3 cm. long, racemose along the main axis.—Ditches and low ground, Southeastern Virginia and Tennessee to Florida, Texas, and southern California. [Widely distributed in tropical and subtropical regions of the Old World.] June–October.

FIG. 64. **Panicum crus-galli L.** BARNYARD-GRASS.—A coarse, ascending or erect, leafy annual 3 to 15 dm. high, with dense panicles and with the third glume awnless to long-awned.—Almost everywhere in the United States in barnyards, waste ground, and river banks. Throughout the warmer regions of both hemispheres. Flowers all summer.

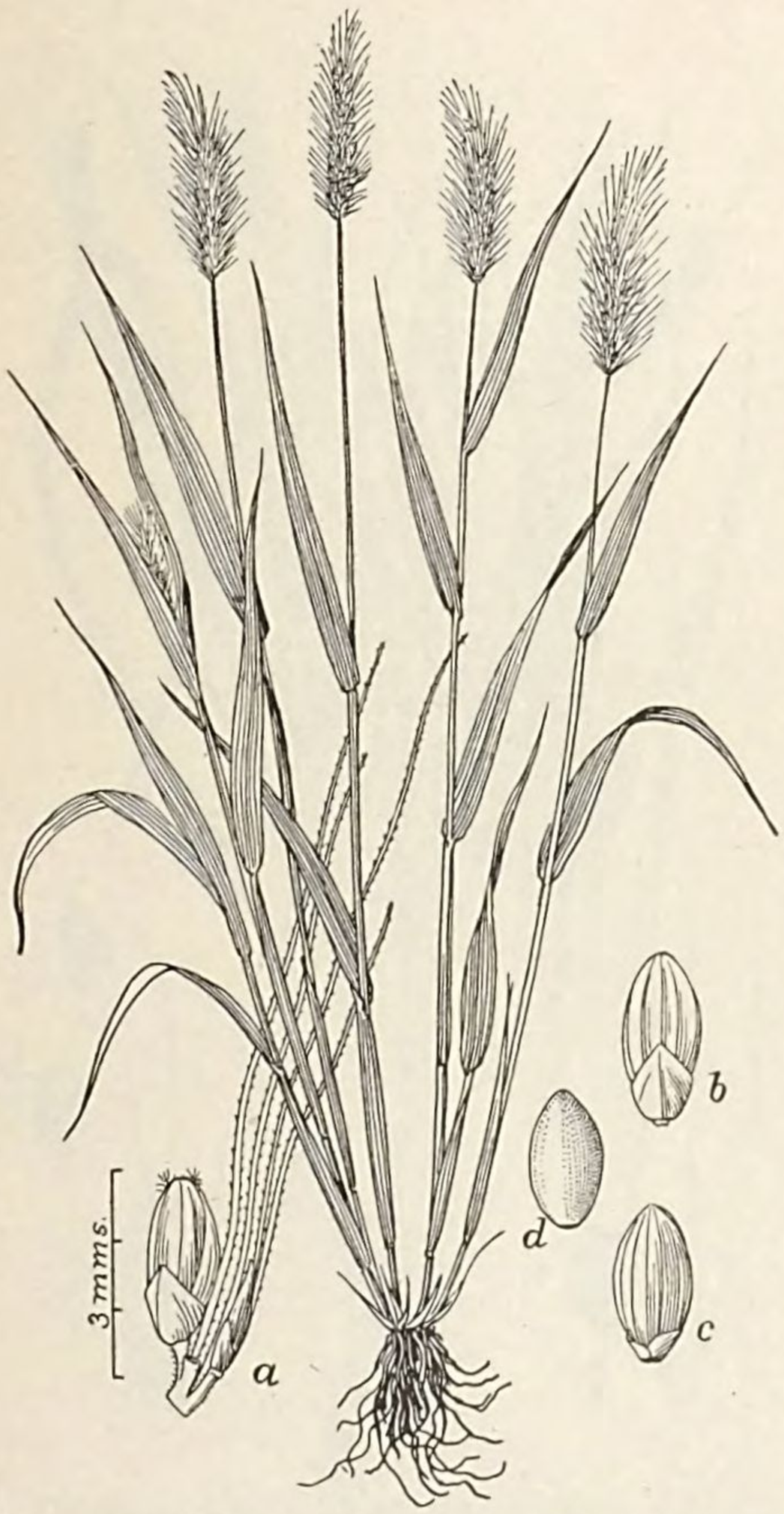

FIG. 65. **Chætochloa viridis** (L.) Scribn. (*Panicum viride* L., *Setaria viridis* Beauv.). GREEN FOXTAIL.—A branching, leafy annual 3 to 6 dm. high, with bristly, densely many-flowered, spike-like panicles 5 to 10 cm. long. Bristles usually green and spikelets smaller than in Yellow Foxtail (*Chætochloa glauca*).—A weed in cultivated and waste grounds; naturalized from Europe. June–October.

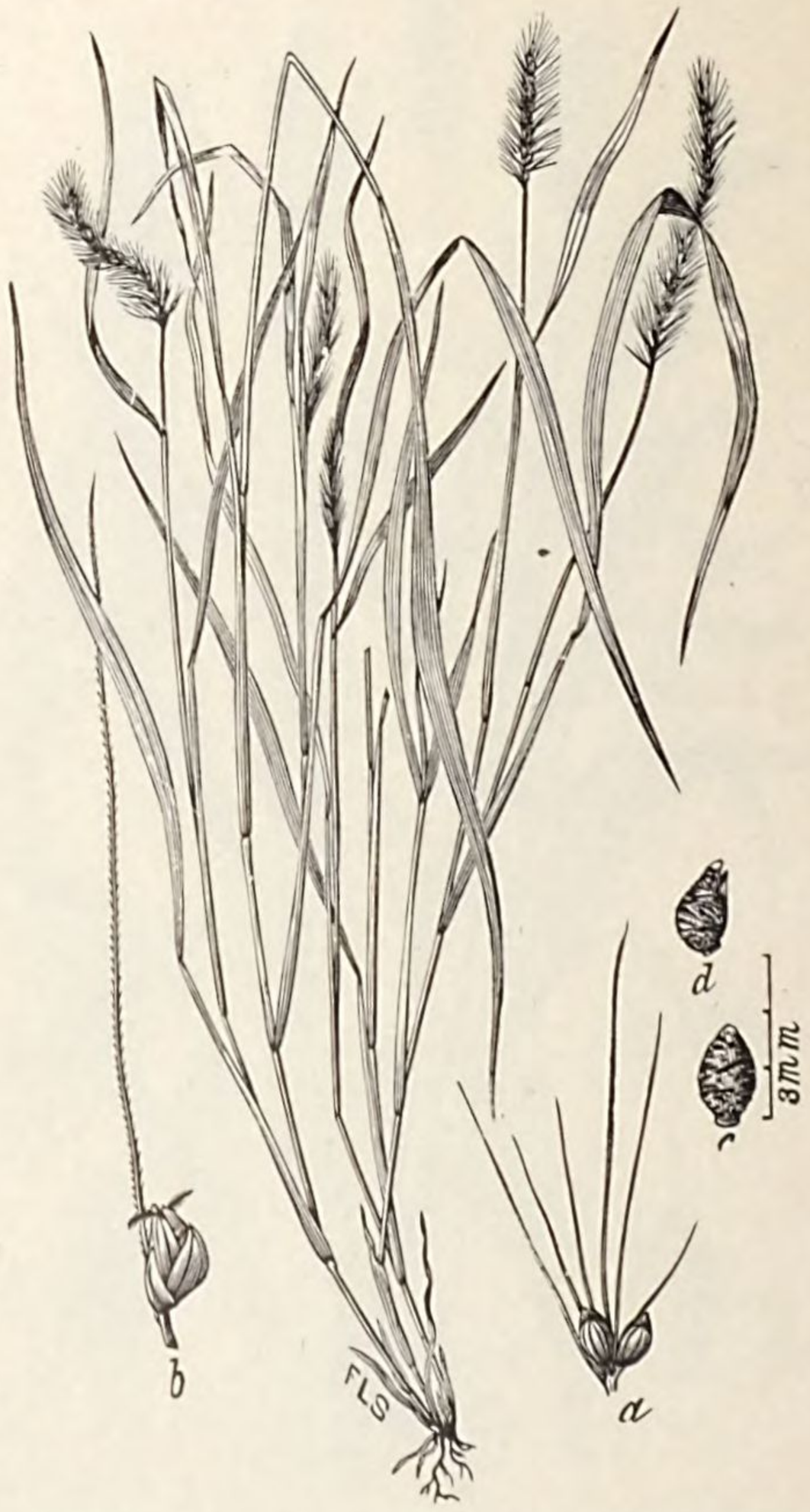

FIG. 66. **Chætochloa corrugata** (Ell.) Scribn. (*Panicum corrugatum* Ell.; *Setaria corrugata* Schult.). ROUGH FOXTAIL.—A rather slender annual 3 to 9 dm. high, usually much branched below, with flat leaves and bristly, spike-like panicles 3 to 10 cm. long.—Usually in cultivated land, Georgia and Florida. May–October.

FIG. 67. **Chætochloa composita** Scribn. (*Setaria composita* HBK.?). BRANCHING FOXTAIL.—A stout perennial 6 to 12 dm. high, with broad, flat leaves, and branching, bristly panicles 10 to 25 cm. long. Spikelets 3 mm. long; second glume one-third shorter than the fourth. (No. 3617, A. H. Curtiss.)—Shell islands and keys, sometimes in old pineapple fields, southern Florida. [West Indies.] July–October.

FIG. 68. **Chætochloa italica** (L.) Scribn. (*Setaria italica* Beauv.). ITALIAN MILLET or HUNGARIAN-GRASS.—A stout and rapidly growing leafy annual 10 to 24 dm. high, with large compound, nodding, bristly, and nearly cylindrical panicles 20 to 40 cm. long —In cultivated and waste land, escaped from cultivation or adventive here and there throughout the country. [Europe, Asia.] July, August.

FIG. 69. **Cenchrus tribuloides L.** SAND BUR.—An annual, with spreading or ascending, much-branched, compressed culms usually about 3 dm. high, and terminal racemes, of 6 to 20 bur-like involucres.—Sandy fields, waste ground, river banks, and sea beaches, Maine and Ontario to South Dakota and Colorado, south to Florida and southern California. [Mexico and South America.] June–October.

FIG. 70. **Cenchrus myosuroides** HBK.; Beal, Grasses N. Am., **2**: 160. LONG-SPIKED BUR-GRASS.—A stout perennial 6 to 8 dm. high, more or less branching and geniculate below, with flat leaves and long, cylindrical spikes 12 to 20 cm. long.—Waste ground, introduced; southern Florida to Texas. [Mexico, South America.) August–January.

FIG. 71. **Pennisetum setosum** (Sw.) Rich.; Beal, Grasses N. Am., **2**: 166.—A stout, branching perennial 9 to 12 dm. high, with flat leaves and dense, bristly, cylindrical spikes 10 to 15 cm. long.—Southern Florida. [Widely distributed in tropical countries.] September.

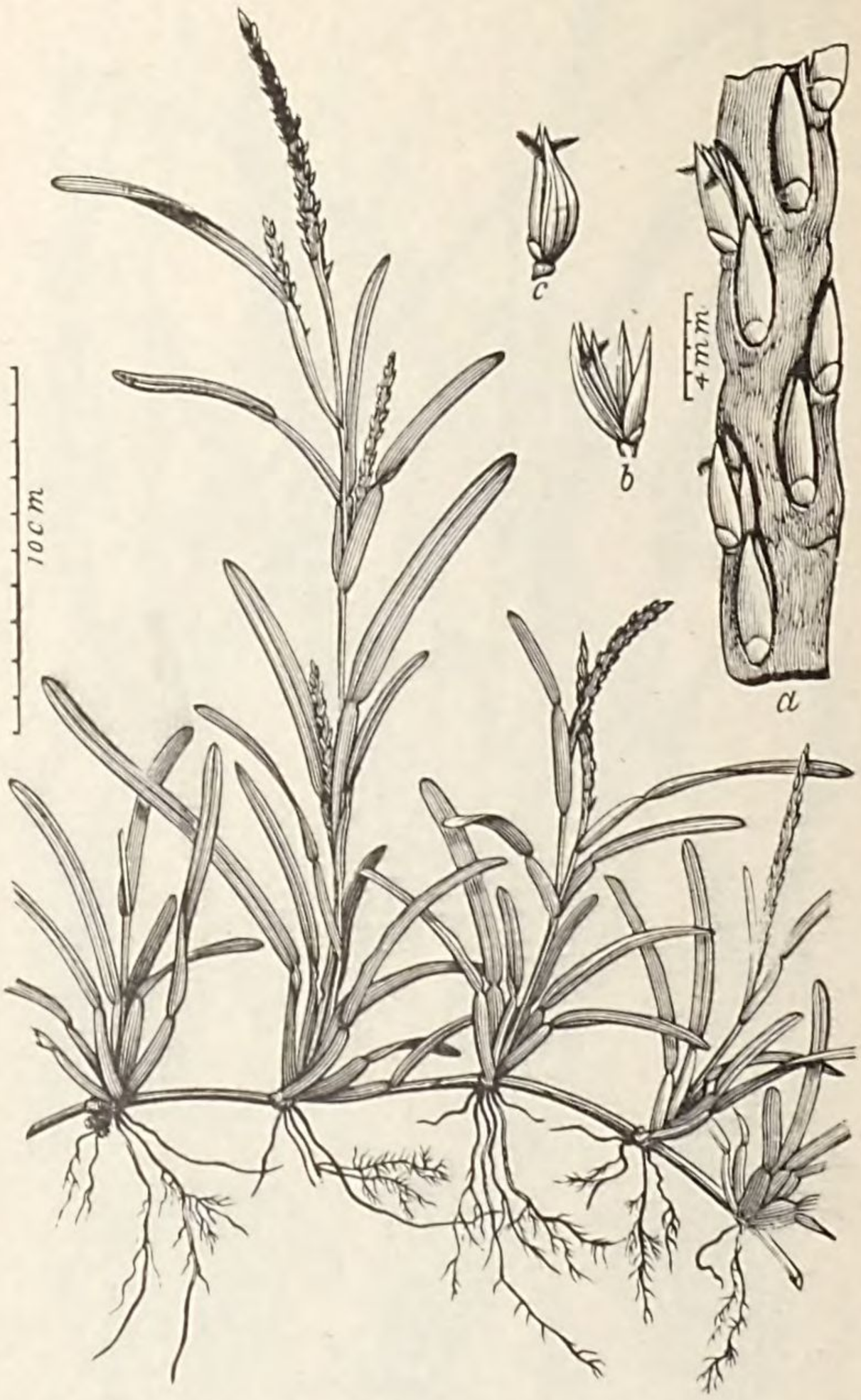

FIG. 72. **Stenotaphrum secundatum** (Walt.) Kuntze (*Ischæmum secundatum* Walt.; *Stenotaphrum americanum* Schrank.). MISSION-GRASS.—Extensively creeping perennial, with hard, flat stems, rather broad leaves, and upright, flowering stems 1.5 to 3 dm. high.—Muddy or moist sandy shores and marshes along the coast, South Carolina to Florida and Louisiana. [Widely distributed in tropical America and the Pacific islands.] April–October.

FIG. 73. **Luziola alabamensis** Chapm.; Beal, Grasses N. Am., **2**: 172.—An aquatic, stoloniferous grass, the upright culms 0.5 to 1.5 dm. high, with long, narrow leaves and the staminate and pistillate spikelets in separate panicles.—In springy places and rivulets in the pine barrens, southern Alabama. [Cuba.] June–October.

FIG. 74. **Homalocenchrus lenticularis** (Michx.) Scribn. (*Leersia lenticularis* Michx.). CATCH-FLY-GRASS.—A rather stout, branching perennial 6 to 12 dm. high, with widely spreading, broad leaf blades, diffuse panicles, and large, ciliate spikelets.—Marshes and wet thickets, near the coast, Virginia to Texas, and in the Mississippi Valley from southern Illinois and Missouri to Louisiana. August, September.

FIG. 75. **Homalocenchrus hexandrus** (Sw.) Britton; Beal Grasses N. Am., **1**: 179 (*Leersia hexandra* Sw.).—A rather slender, usually erect, branching grass 6 to 12 dm. high, with narrow, many-flowered panicles 10 to 15 cm. long.—In swamps and ditches near the coast, North Carolina to Florida and Texas. [In all tropical and many subtropical countries.] May–September.

FIG. 76. **Homalocenchrus oryzoides** (Sw.) Poll. (*Leersia oryzoides* Sw.); Britton and Brown, Ill. Fl., **1**: 129. RICE CUT-GRASS.—A rather stout, rough, and much-branched grass 6 to 12 dm. high, with open, pale-green or straw-colored panicles 12 to 25 cm. long.—Along streams and ditches and in marshes, usually in the open, Nova Scotia and Ontario to Washington, Florida, and Texas. [Europe and Asia.] August–October.

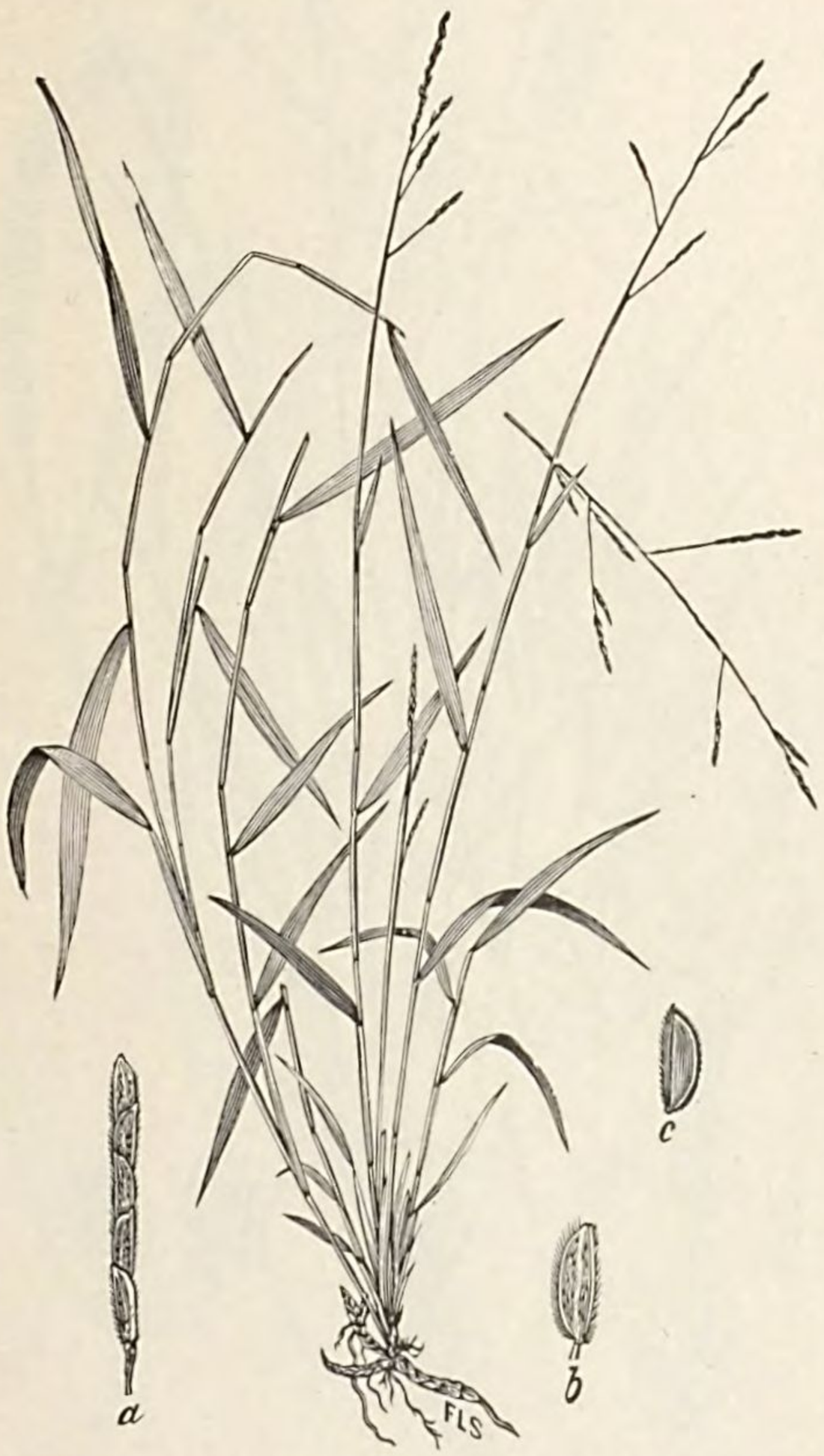

FIG. 77. **Homalocenchrus virginicus** (Willd.) Britton, (*Leersia virginica* Willd.). WHITE-GRASS.—A slender, erect, or ascending, usually much-branched, perennial 6 to 12 dm. high, with narrow leaves and simple panicles 8 to 12 cm. long.—Moist thickets and low woods, usually along streams, Maine and Ontario to South Dakota, southward to Florida, and Texas. May–October.

FIG. 78. **Homalocenchrus monandrus** (Sw.) Britton (*Leersia monandra* Sw.); Beal, Grasses N. Am., **2**: 179. SLENDER CUT-GRASS.—A slender, sparingly branched grass with somewhat wiry culms 3 to 6 dm. high, and usually glaucous leaves.—Keys of south Florida (in coral soil) and in southern Texas. [Mexico, West Indies, and South America.] February–May.

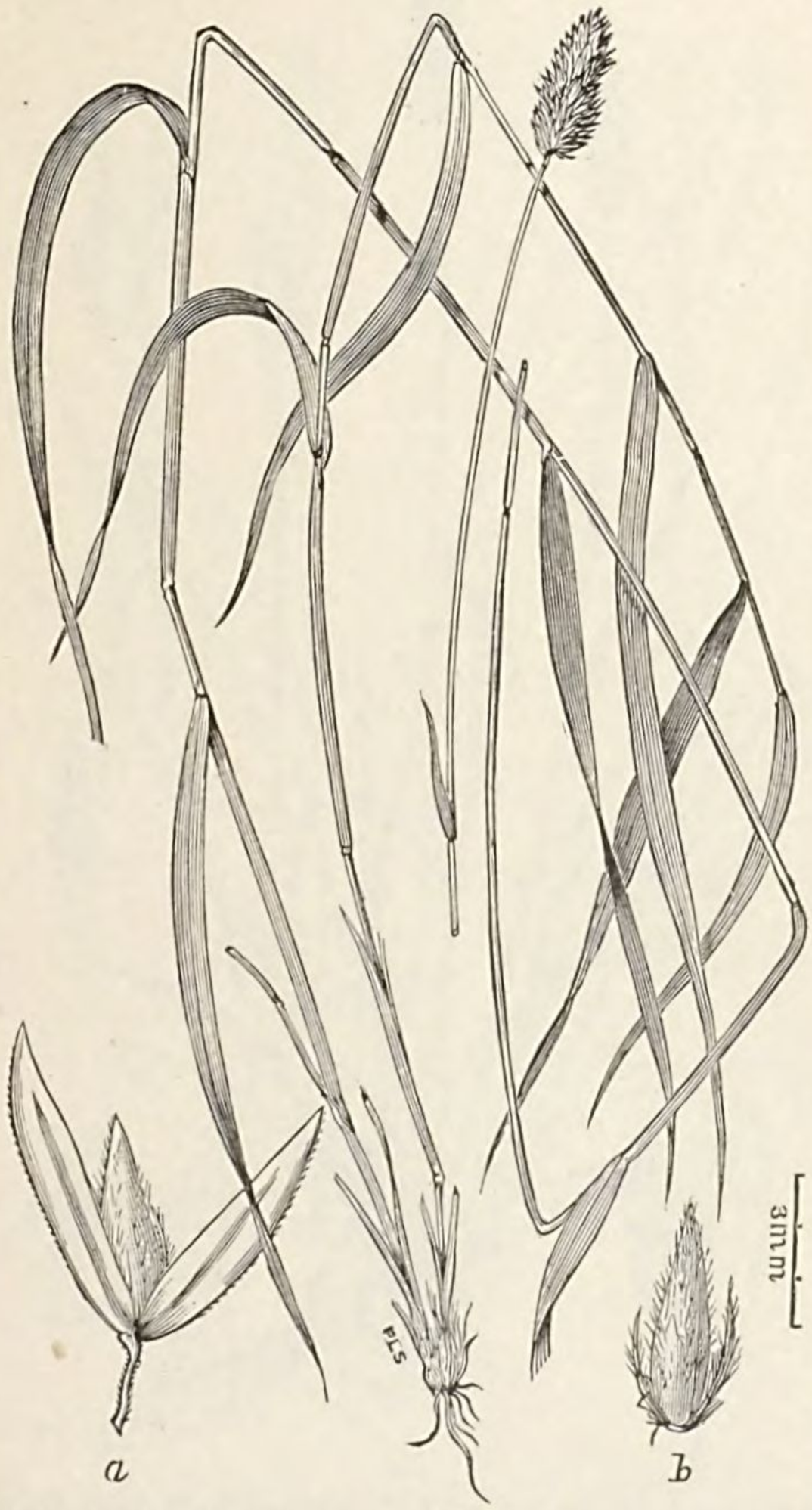

FIG. 79. **Phalaris amethystina** Trin.; Beal, Grasses N. Am., **2**: 183. PURPLE CANARY-GRASS.—A stout annual 4 to 9 dm. high, with broad, flat leaves, and ovoid or oblong, densely-flowered terminal panicles.—**Oregon to California and southward to Chile.** June.

FIG. 80. **Phalaris caroliniana** Walt. (*P. intermedia* Bosc.). SOUTHERN CANARY-GRASS.—A comparatively slender species 3 to 6 dm. high, with rather short, flat leaves, and ovoid, densely flowered, capitate panicles 2 to 5 cm. long.—River bottoms and wet places, South Carolina to Indian Territory, Texas, Nevada, California, and Oregon. April.

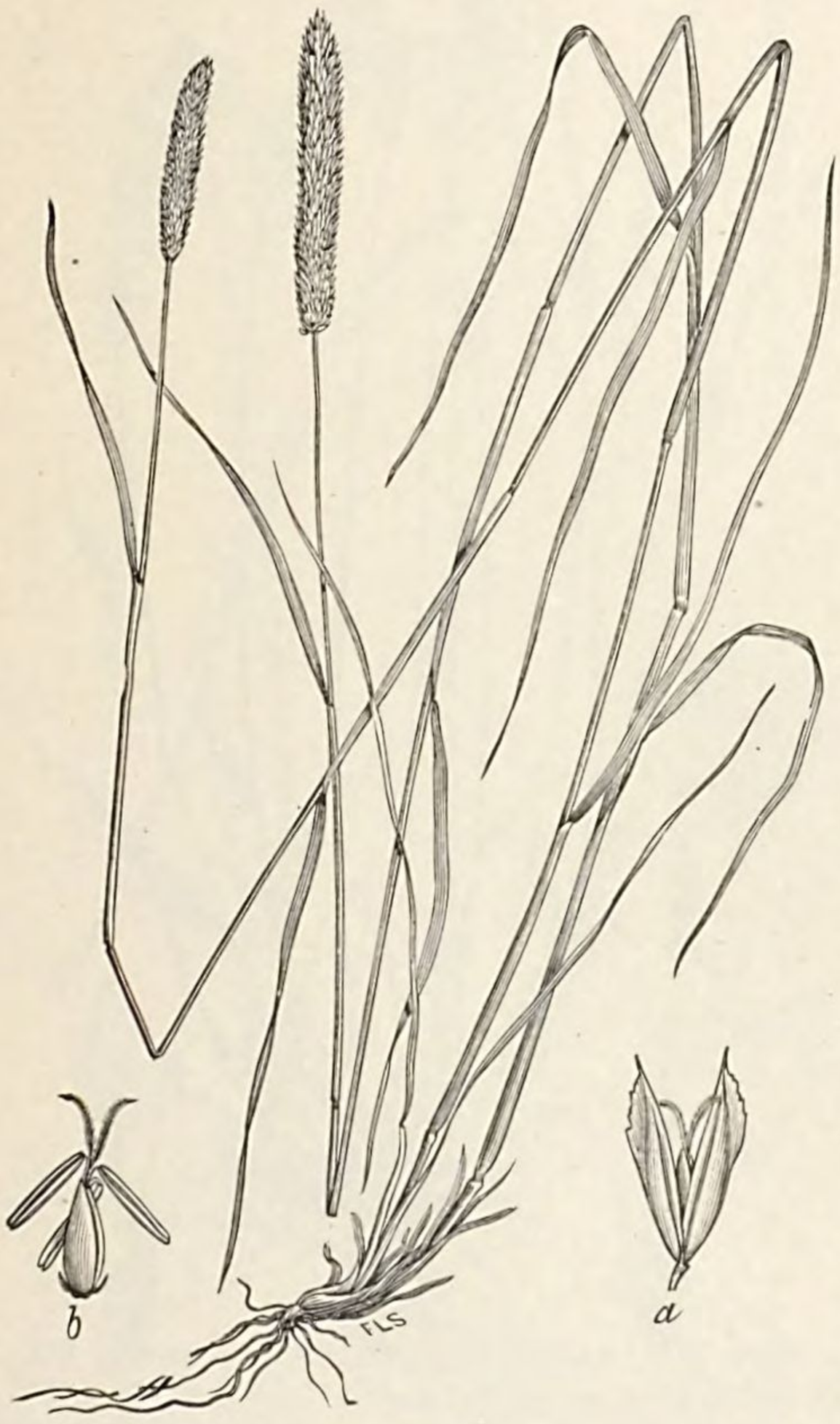

FIG. 81. **Phalaris angusta** Nees (*P. intermedia angusta* Chapm.). CALIFORNIA TIMOTHY.--A stout grass 6 to 14 dm. high, with narrow, densely flowered, spike-like panicles 6 to 12 cm. long.—In wet places, South Carolina and Louisiana to southern California. [South America.] May. Cultivated to a limited extent in the Southern States.

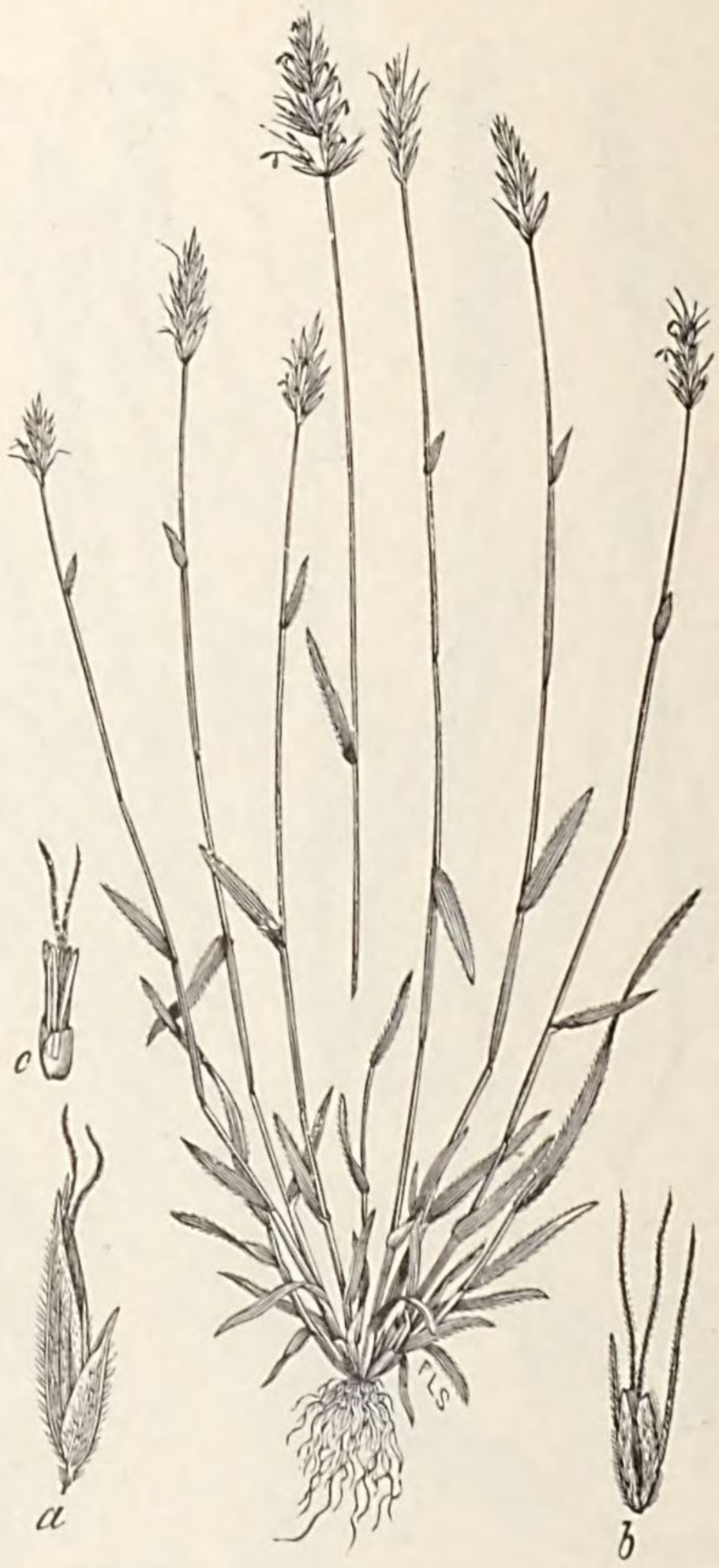

FIG. 82. **Anthoxanthum odoratum** L. SWEET VERNAL-GRASS.—A sweet-scented grass, with slender, erect, tufted culms, flat leaf-blades and narrow, spike-like terminal panicles.—Abundantly naturalized in lawns, fields, and waysides from Newfoundland and Ontario to North Carolina and Tennessee. [Europe, northwestern Asia, and northern Africa.] May–September.

FIG. 83. **Savastana odorata** (L.) Scribn. (*Hierochloë borealis* R. & S.). VANILLA-GRASS.—A slender, sweet-scented, stoloniferous perennial 3 to 6 dm. high, with short culm-leaves and brownish, open panicles. The flat leaves of the sterile shoots are 1 to 3 dm. long.—Newfoundland and New Brunswick to southern New York, west to Minnesota and Iowa; in the Rockies from British America south to Arizona and Mexico; Alaska southward in the mountains to Oregon. [Cooler temperate regions and high mountains of both hemispheres.] April–August.

FIG. 84. **Savastana macrophylla** (Thurb.) (*Hierochloë macrophylla* Thurb.); Beal, Grasses N. Am., **2**: 187. LARGE-LEAFED VANILLA-GRASS.—A rather stout, native perennial 6 to 10 dm. high, with long and broad leaves and loosely flowered panicles, usually about 4 inches long.—Coniferous woods, California and Oregon. March–May.

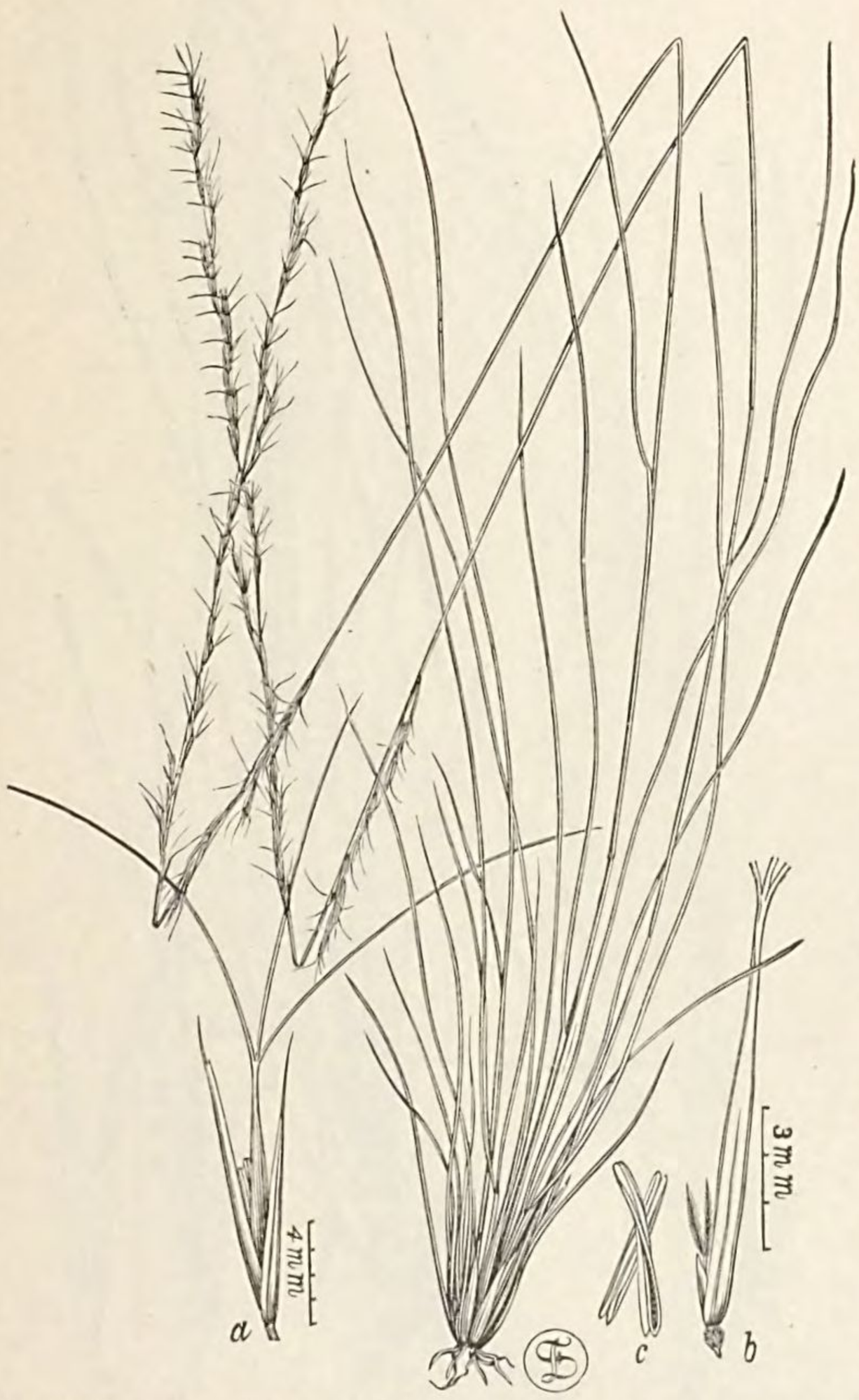

FIG. 85. **Aristida stricta** Michx. WIRE-GRASS.—A rigid, erect wiry perennial 6 to 12 dm. high, with narrow, involute leaves and strict, spike-like panicles about 30 cm. long.—Dry pine barrens near the coast, Virginia (?) and North Carolina to Mississippi, often covering extensive tracts and forming the bulk of the pasturage. July–October.

FIG. 86. **Aristida palustris** (Chapm.) Vasey (*A. virgata palustris* Chapm.). SWAMP POVERTY-GRASS.—An upright, rigid perennial 6 to 15 dm. high, with long, narrow leaves, and slender, interrupted, spicate panicles 30 to 70 cm. long.—Moist places near the coast in the pine barrens, South Carolina to Texas. [Cuba.] August–October.

FIG. 87. **Aristida gossypina** Bosc (*A. lanata* Poir.). WOOLLY POVERTY-GRASS.—A rather stout perennial, with simple stems 6 to 12 dm. high, and narrow panicles 30 to 60 cm. long. Lower sheaths usually wooly.—Dry pine barrens, mostly near the coast, Delaware to Texas and Indian Territory. September-November.

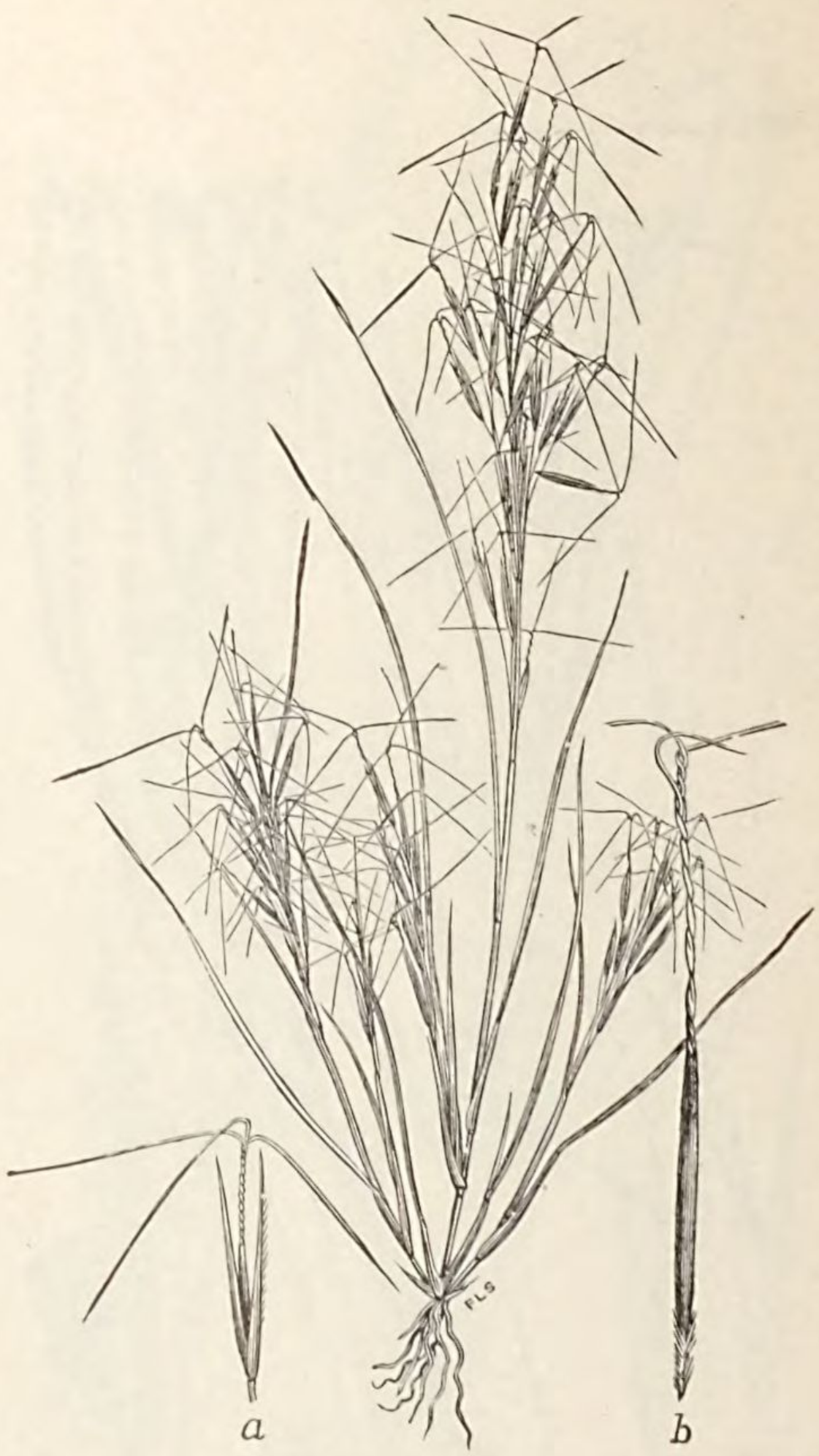

FIG. 88. **Aristida tuberculosa** Nutt. LONG-AWNED POVERTY-GRASS.—A rigid, much-branched perennial 3 to 4.5 dm. high, with nearly simple panicles 10 to 18 cm. long. The widely spreading, nearly equal awns 3 to 4 cm. long.—Dry, sandy soil, near the coast, Massachusetts to Mississippi; also in Illinois, Wisconsin, and Minnesota. August–October.

FIG. 89. **Stipa spartea** Trin. PORCUPINE-GRASS.—A stout, erect perennial, with simple culms 6 to 10 dm. high, long, narrow leaves and few-flowered panicles. The strong, twisted awns are 8 to 15 cm. long, and at the base of the flowering glume is a long, pointed, and bearded callus.—Prairies, Illinois to Colorado, north to Manitoba and British Columbia. June–August.

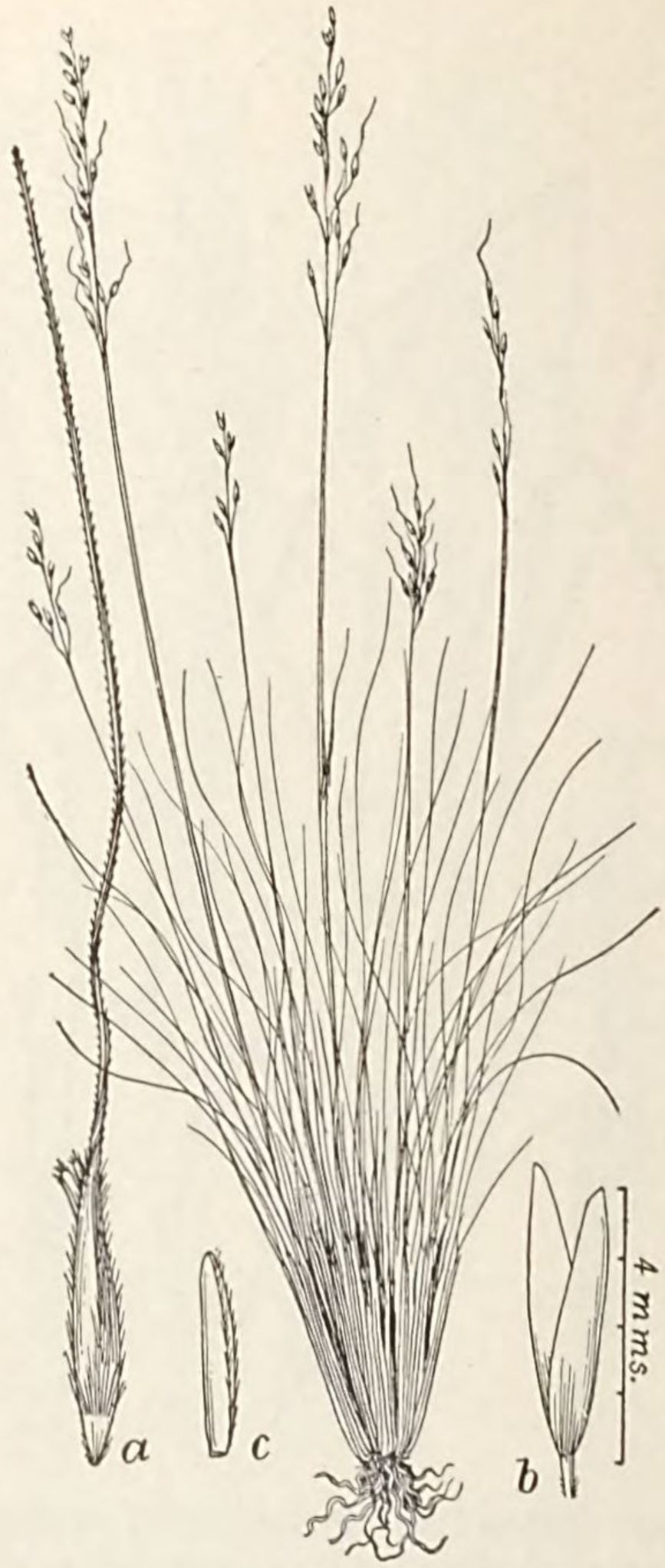

FIG. 90. **Stipa kingii** Boland. (*Oryzopsis kingii* Beal, Grasses N. Am., **2**: 229).—A slender, erect, cæspitose perennial 2 to 4 dm. high, with involute, filiform leaves and contracted panicles 8 to 12 cm. long. Awns scabrous.—California and (?) Nevada.

FIG. 91. **Stipa mongolica** Trin.; Beal, Grasses N. Am., **2** : 227 (sub *Oryzopsis*).—A slender, densely tufted perennial about 3 dm. high, with short, setaceous leaves and loosely few-flowered panicles. Awns plumose.—Mountains of Colorado. [Eastern Asia.]

FIG. 92. **Oryzopsis melanocarpa** Muhl. BLACK MOUNTAIN RICE.—A rather stout, long- and broad-leafed perennial 3 to 9 dm. high, with narrow, simple panicles of a few, large spikelets.—Open rocky woods, sometimes on cliffs, Quebec and Ontario to Delaware, Kentucky, Missouri, and Minnesota. July–September.

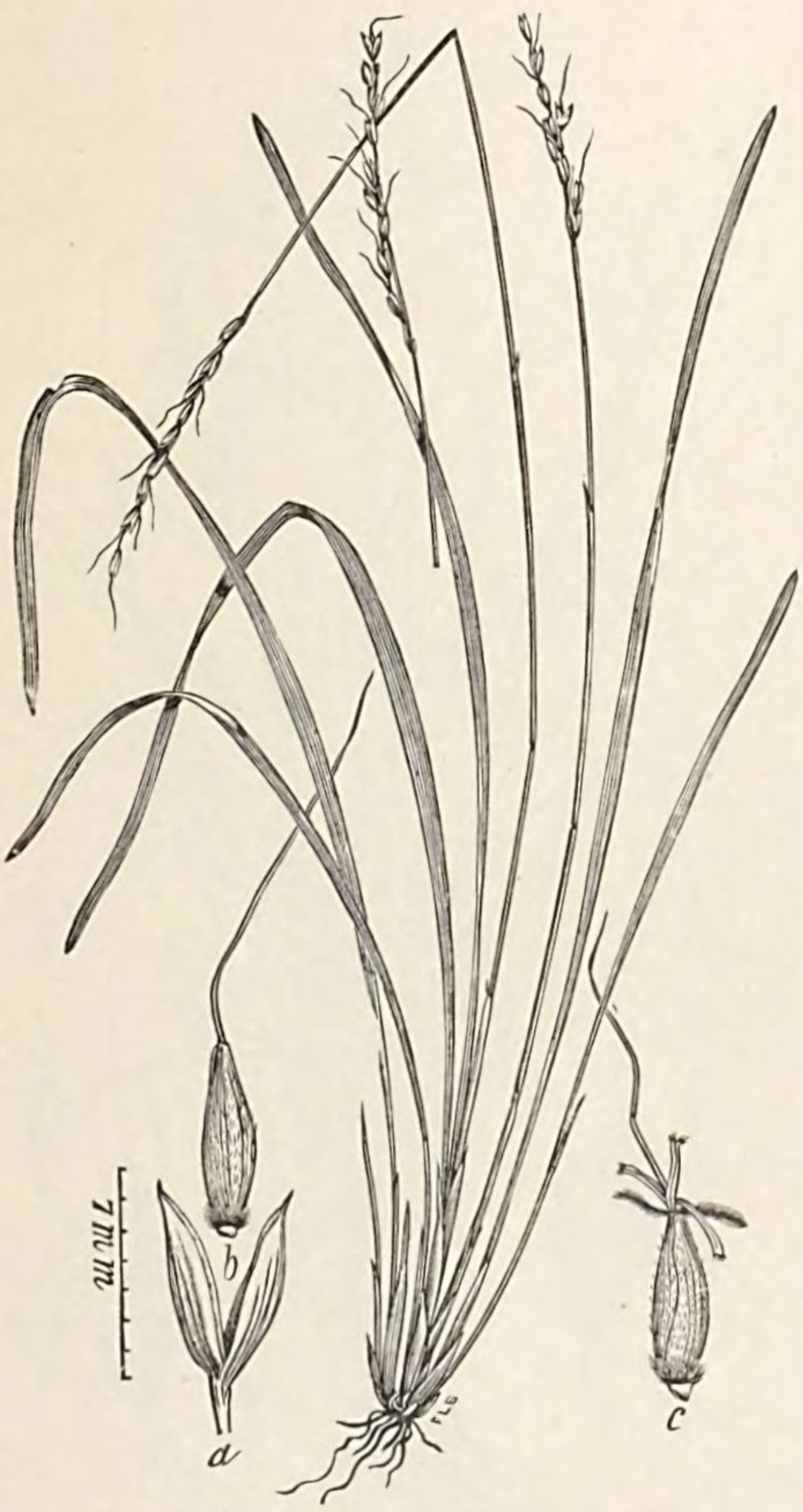

FIG. 93. **Oryzopsis asperifolia** Michx. WHITE MOUNTAIN RICE.—A slender perennial 1.5 to 5 dm. high, with narrow, simple panicles 6 to 10 cm. long. The basal leaves, which are 5 to 7 mm. wide, often overtop the culm.—Woods, Newfoundland, Massachusetts and New Jersey, to Minnesota and British Columbia, and southward in the Rockies to New Mexico. April-July.

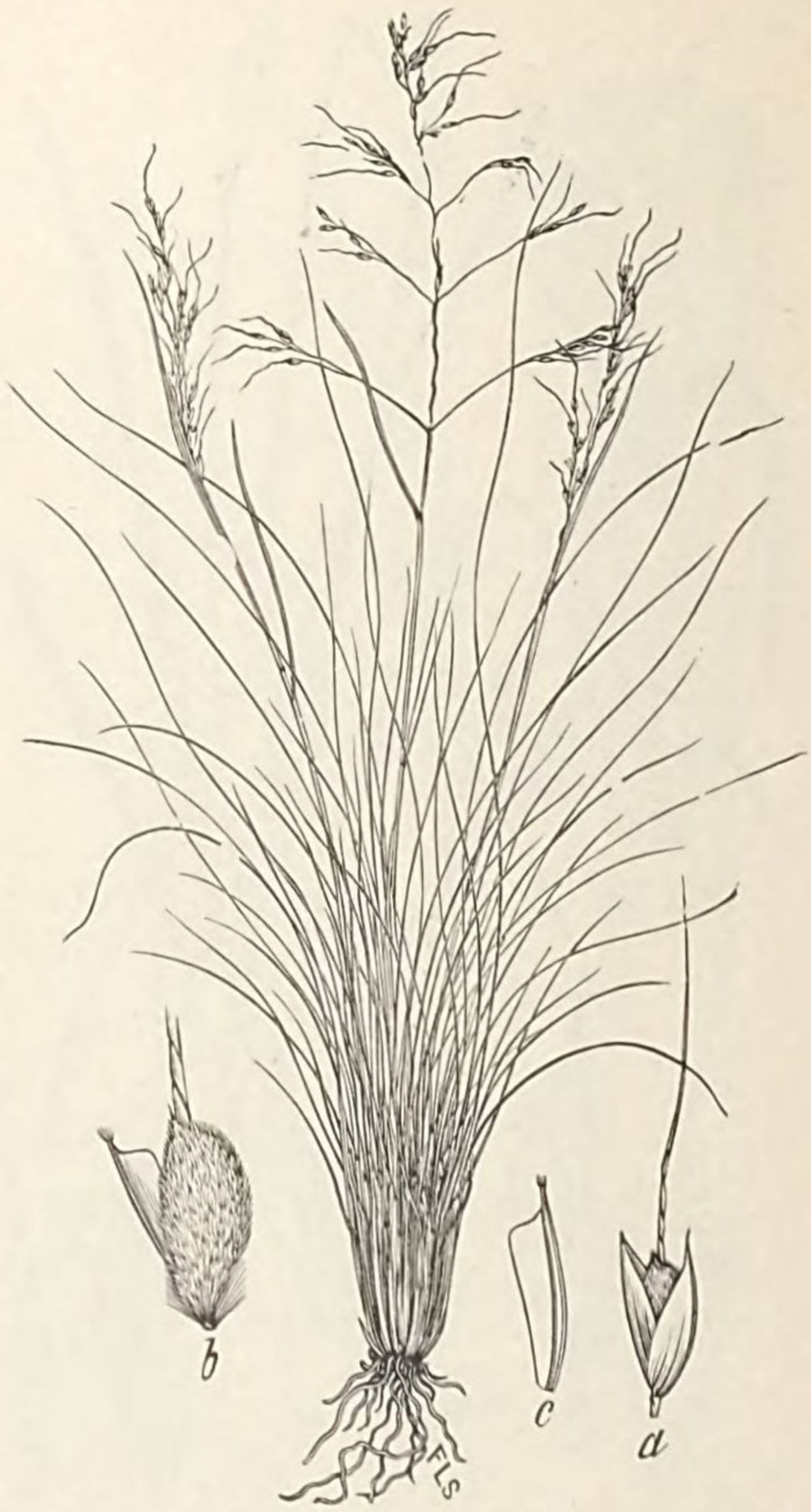

FIG. 94. **Oryzopsis fimbriata** (HBK.) Hemsl.; Beal, Grasses N. Am., **2**: 231.—A slender, tufted perennial 5 to 8 dm. high, with very narrow, involute leaves and loosely flowered panicles 10 to 13 cm. long.—In canyons and under limestone cliffs, mountains of western Texas to California. [Mexico and Lower California.] July–September.

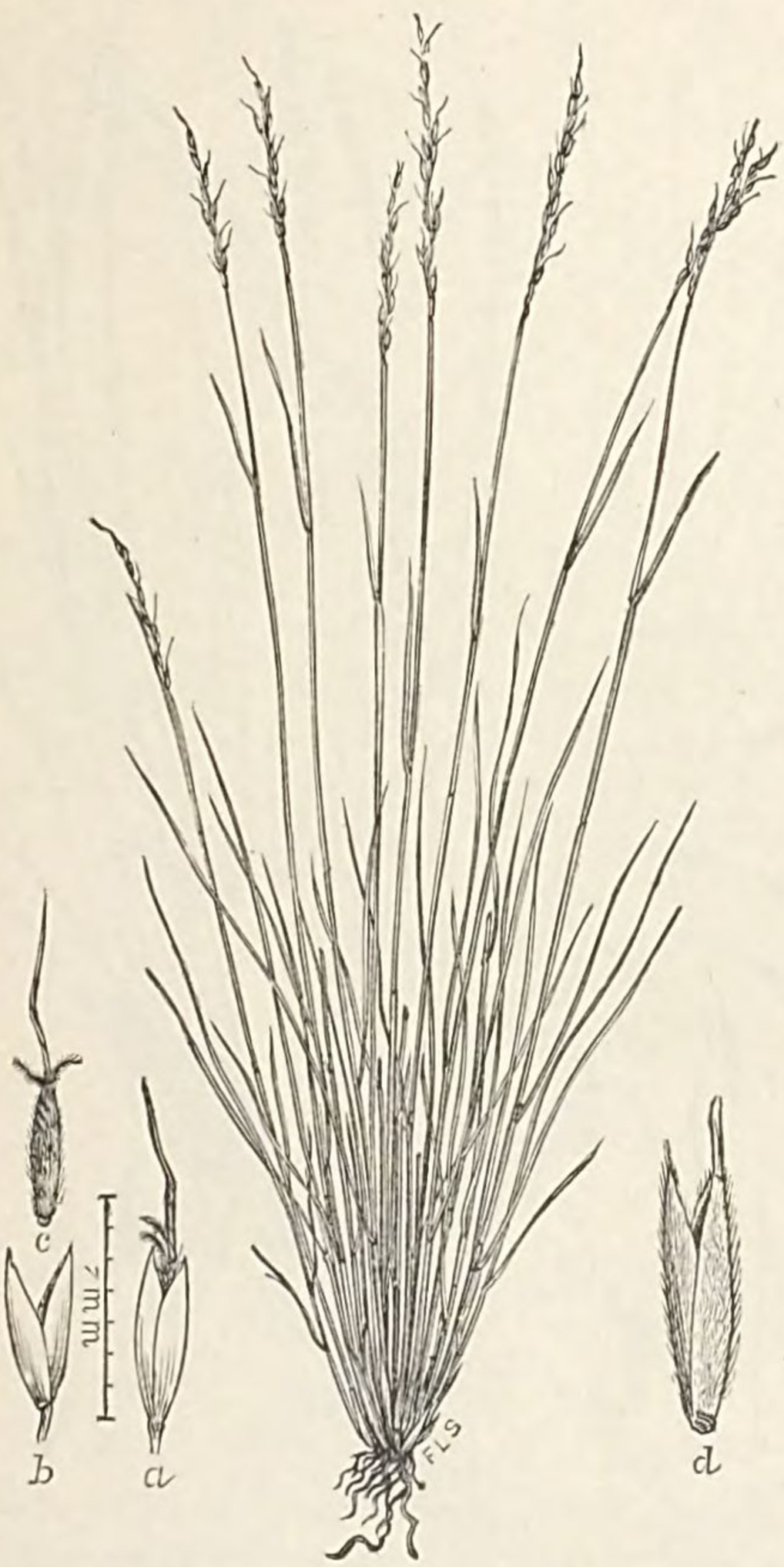

FIG. 95. **Oryzopsis exigua** Thurb.; Beal, Grasses N. Am., **2**: 227. LITTLE MOUNTAIN RICE.—A slender native perennial 1.5 to 3 dm. high, with filiform leaves, and narrow, simple, few-flowered panicles 2 to 5 cm. long.—Among rocks in canyons and on mountain tops, Montana and Wyoming to Utah, Oregon, and Washington. June–August.

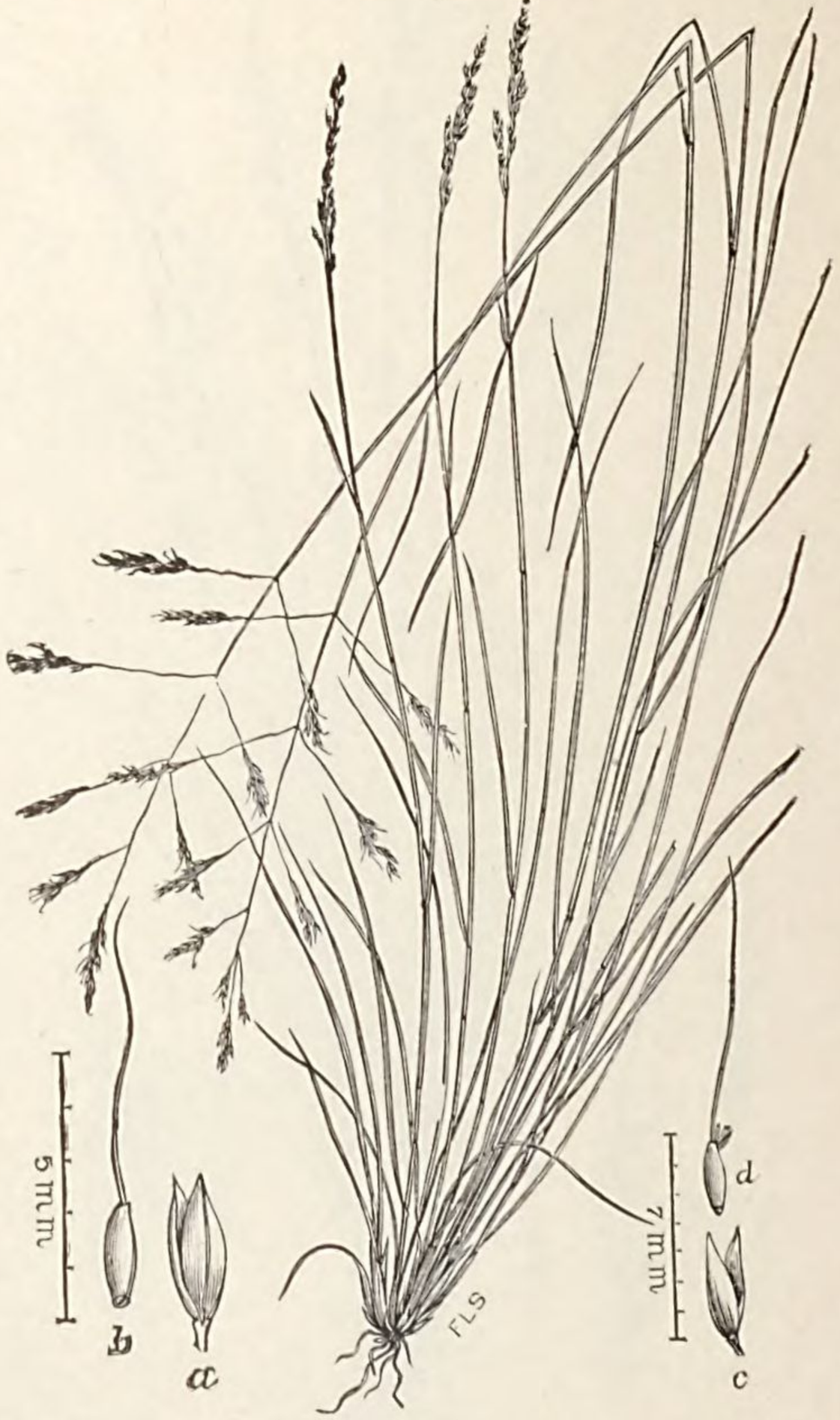

FIG. 96. **Oryzopsis micrantha** (Trin. & Rupr.) Thurb. SMALL-FLOWERED MOUNTAIN RICE.—A slender, erect perennial, usually about 6 dm. high, with narrow leaves and small-flowered, open panicles 8 to 16 cm. long.—Woods, river bluffs, and mountain sides, South Dakota to Nebraska, Colorado, New Mexico, and Arizona. June–August.

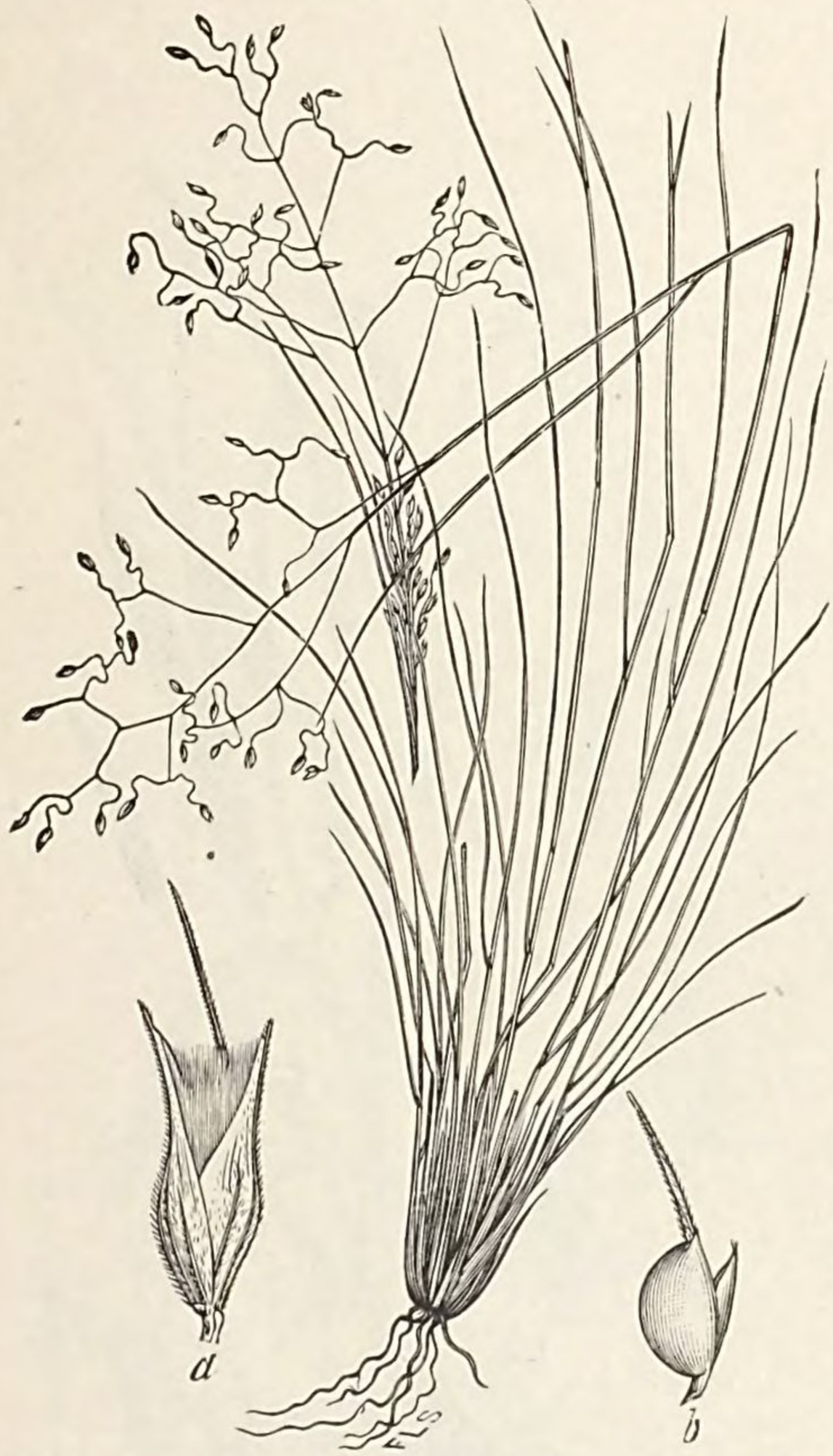

FIG. 97. **Eriocoma cuspidata** Nutt. (*Stipa membranacea* Pursh, not Linn.; *Oryzopsis membranacea* V.). INDIAN MILLET.—A native perennial, growing in bunches 3 to 7 dm. high, with narrow, involute leaves and peculiarly branched, diffuse panicles 12 to 15 cm. long.—Grassy slopes, dry hillsides, sandy river banks, about springs in deserts, in cultivated fields, etc., South Dakota to New Mexico, California, and British Columbia. [Mexico.] May–September.

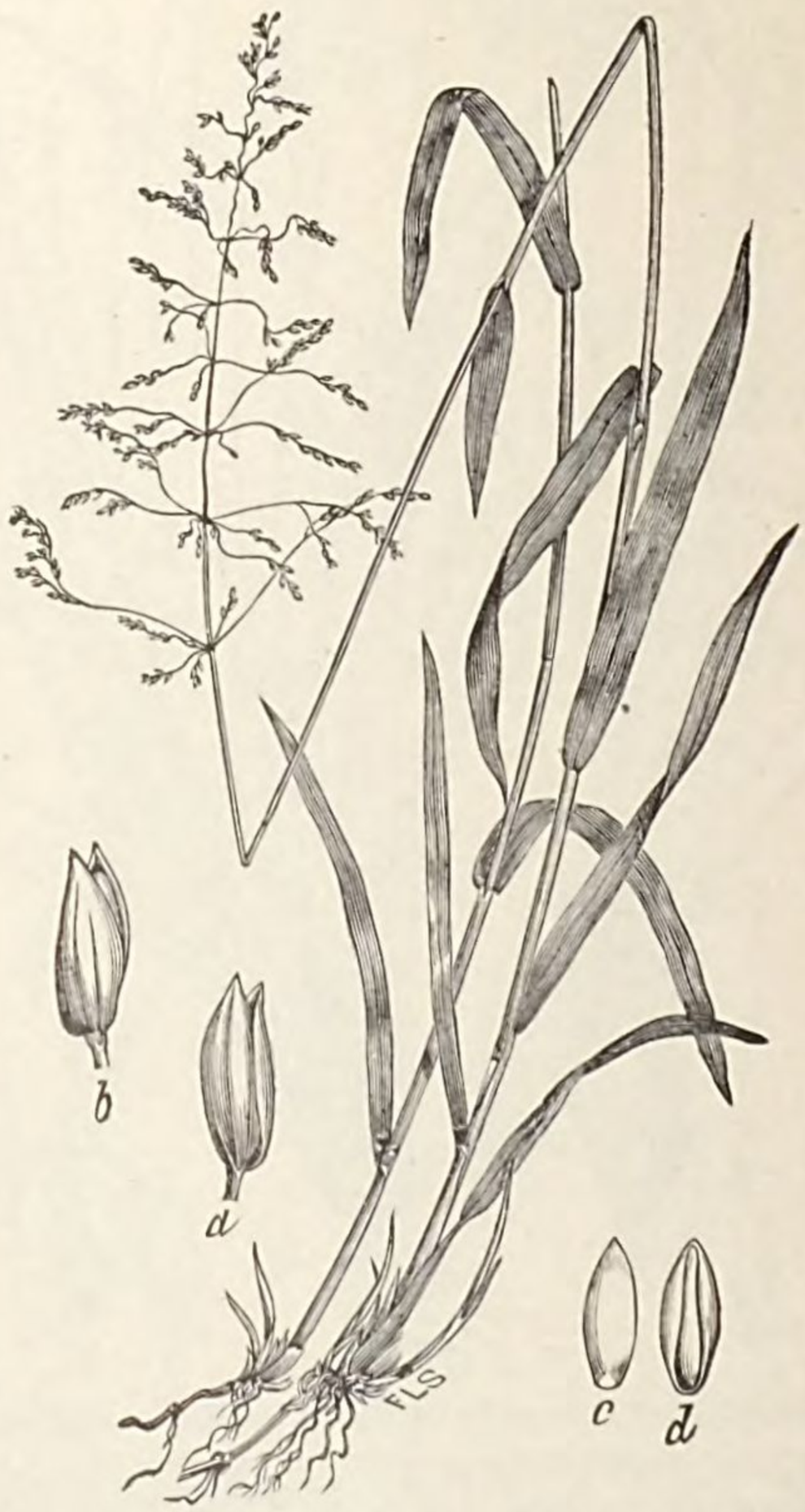

FIG. 98. **Milium effusum** L. WILD MILLET.—A pale-green perennial, with simple culms 6 to 14 dm. high, broad, flat, spreading leaves and diffuse panicles 15 to 18 cm. long.—Woods and ravines, Cape Breton Island to western Ontario, Pennsylvania, Michigan, and Minnesota. [Europe, Asia.] June, July.

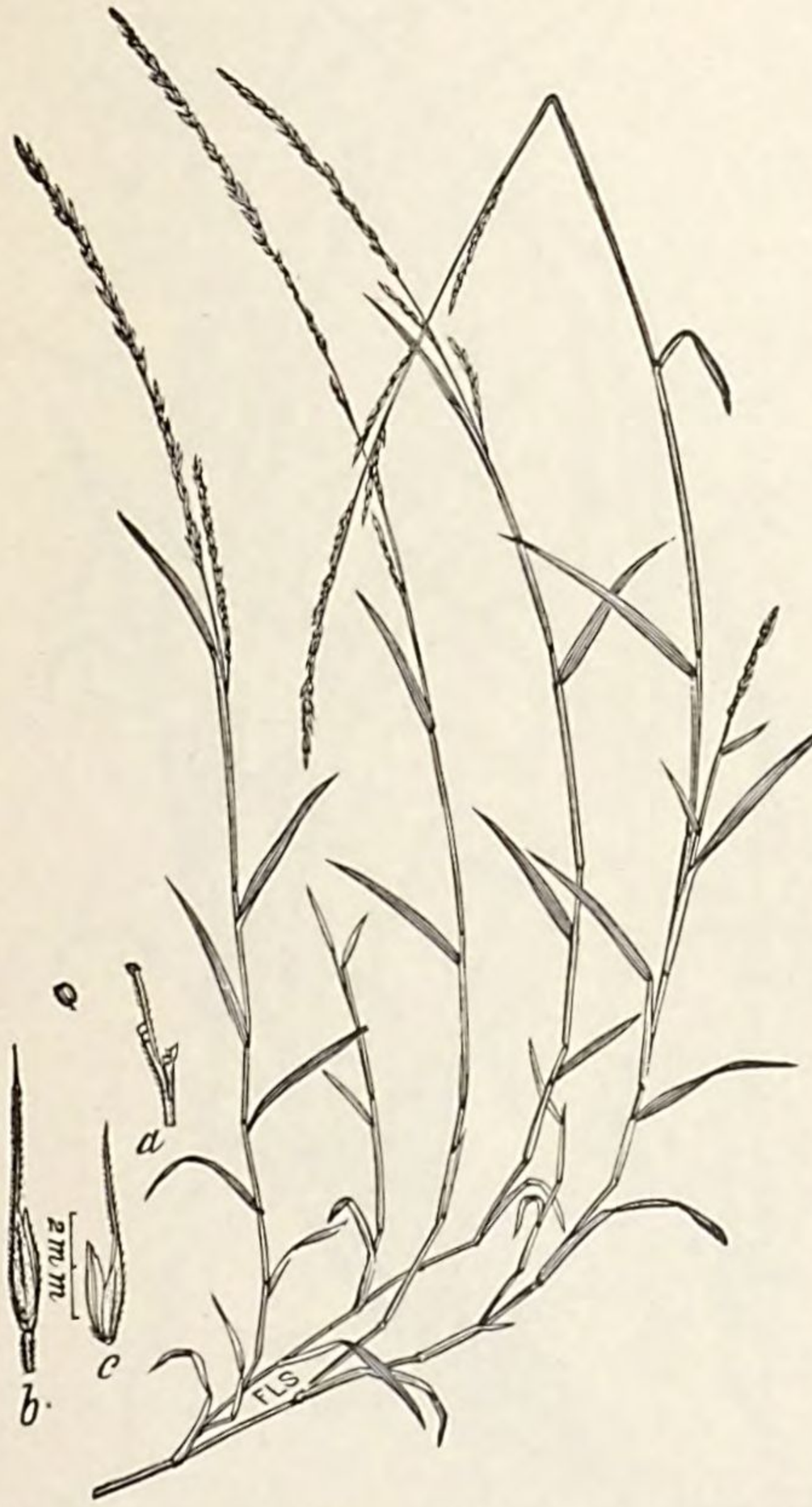

FIG. 99. **Muhlenbergia diffusa** Schreb. NIMBLE WILL.—A low, slender perennial, with ascending, much-branched wiry culms 3 to 6 dm. long, flat leaf-blades and narrow, rather densely flowered panicles.—In shade in thickets, borders of woods, waste ground about dwellings, etc , Maine and Ontario to Minnesota, Kansas, Texas, and Florida. [Mexico (?)] August–January (in Louisiana).

FIG. 100. **Muhlenbergia mexicana** (L.) Trin. MEXICAN DROPSEED.—An upright or ascending, usually much-branched perennial 3 to 9 dm. high, with a scaly, creeping rootstock, numerous, flat leaf blades and contracted, densely flowered panicles.—Sandy or rocky banks of streams and low thickets, New Brunswick and Ontario to North Carolina, Indian Territory, and South Dakota.

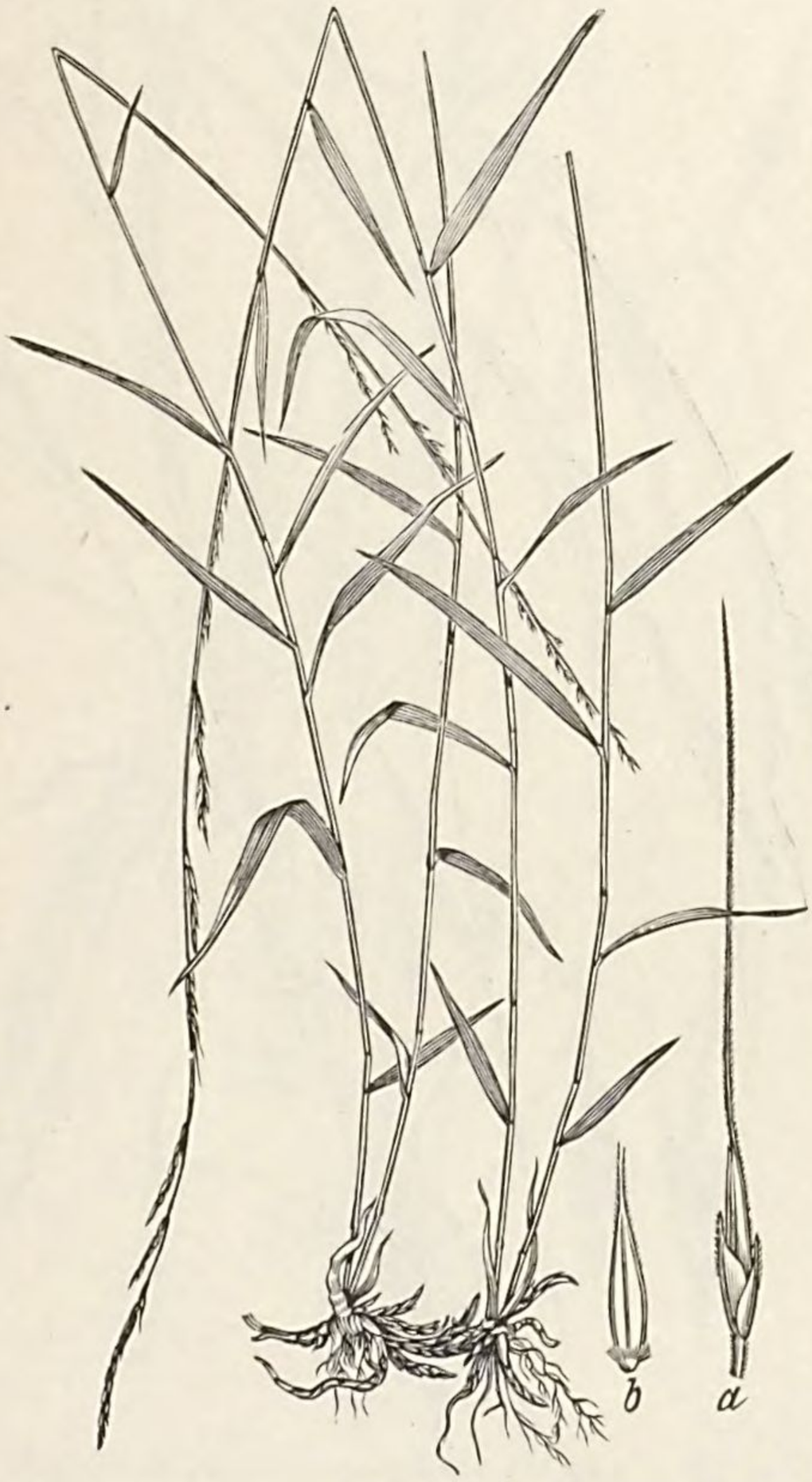

FIG. 101. **Muhlenbergia tenuiflora** (Willd.) B. S. P. (*M. willdenovii* Trin.). SLENDER-FLOWERED DROPSEED.—An erect, simple or sparingly branched perennial 3 to 9 dm. high, with creeping, scaly rootstocks, flat leaf blades and rather few-flowered, linear panicles.—Rocky woods, Massachusetts to Ontario, Minnesota, Texas, Alabama, and Virginia. August, September.

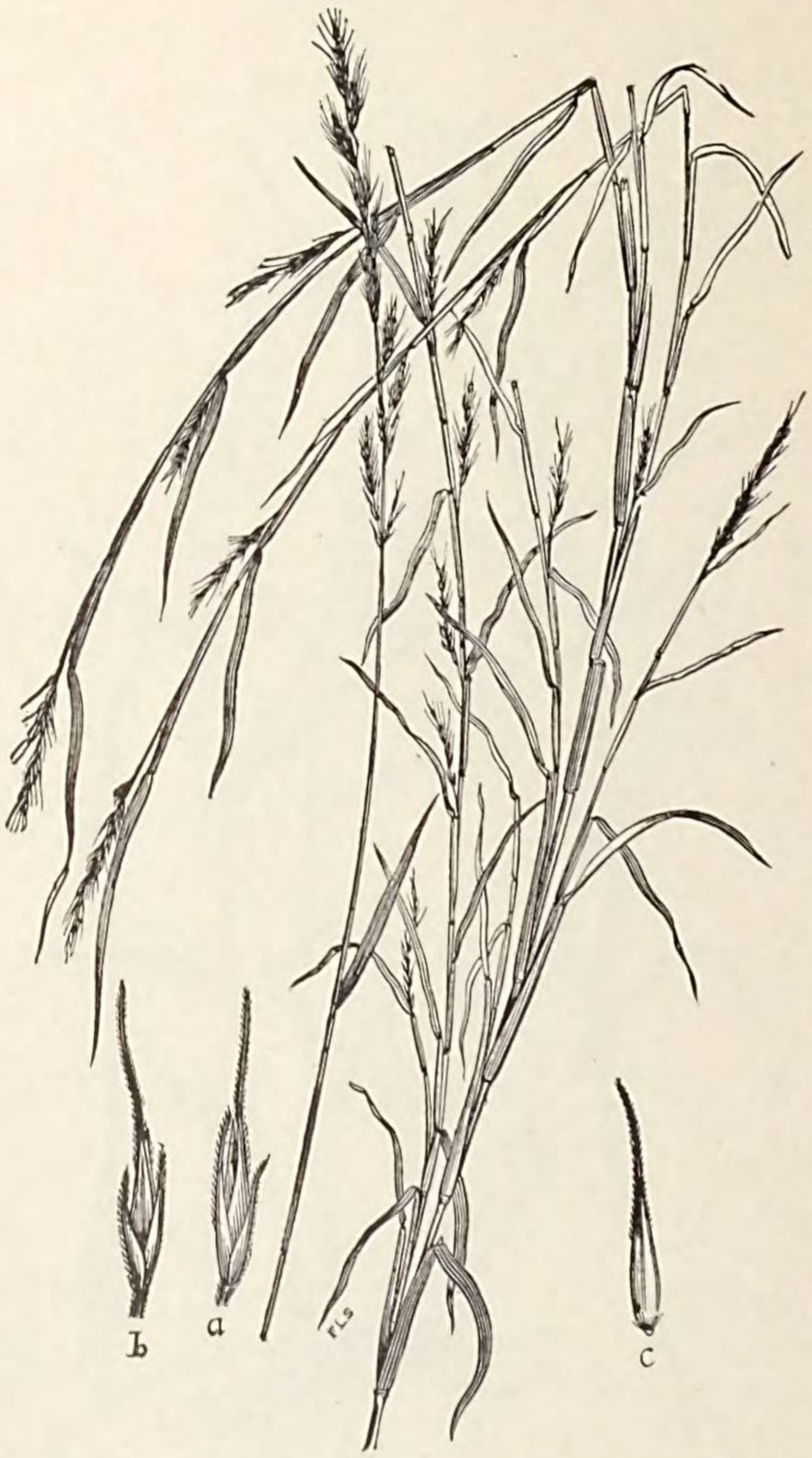

FIG. 102. **Muhlenbergia sylvatica** Torr. WOODLAND DROPSEED.—A perennial, usually much-branched grass 6 to 9 dm. high, with strong, scaly rootstocks, flat leaves and narrow, densely flowered panicles 5 to 15 cm. long.—In rocky woods, and wooded banks of streams, New Brunswick and Ontario to North Carolina, Tennessee, Texas, Kansas, and Minnesota. August–October.

FIG. 103. **Muhlenbergia racemosa** (Michx.) B. S. P.; Britton and Brown Ill. Fl., **1**: 143 (*M. glomerata* Trin.). WILD TIMOTHY.—A rather stout, upright perennial, with very tough and densely scaly rootstocks, nearly simple culms 6 to 9 dm. high, and densely flowered, narrow panicles 5 to 10 cm. long.—Moist meadows and low grounds, Newfoundland to New Jersey, Missouri, Arizona, and British Columbia. June–September.

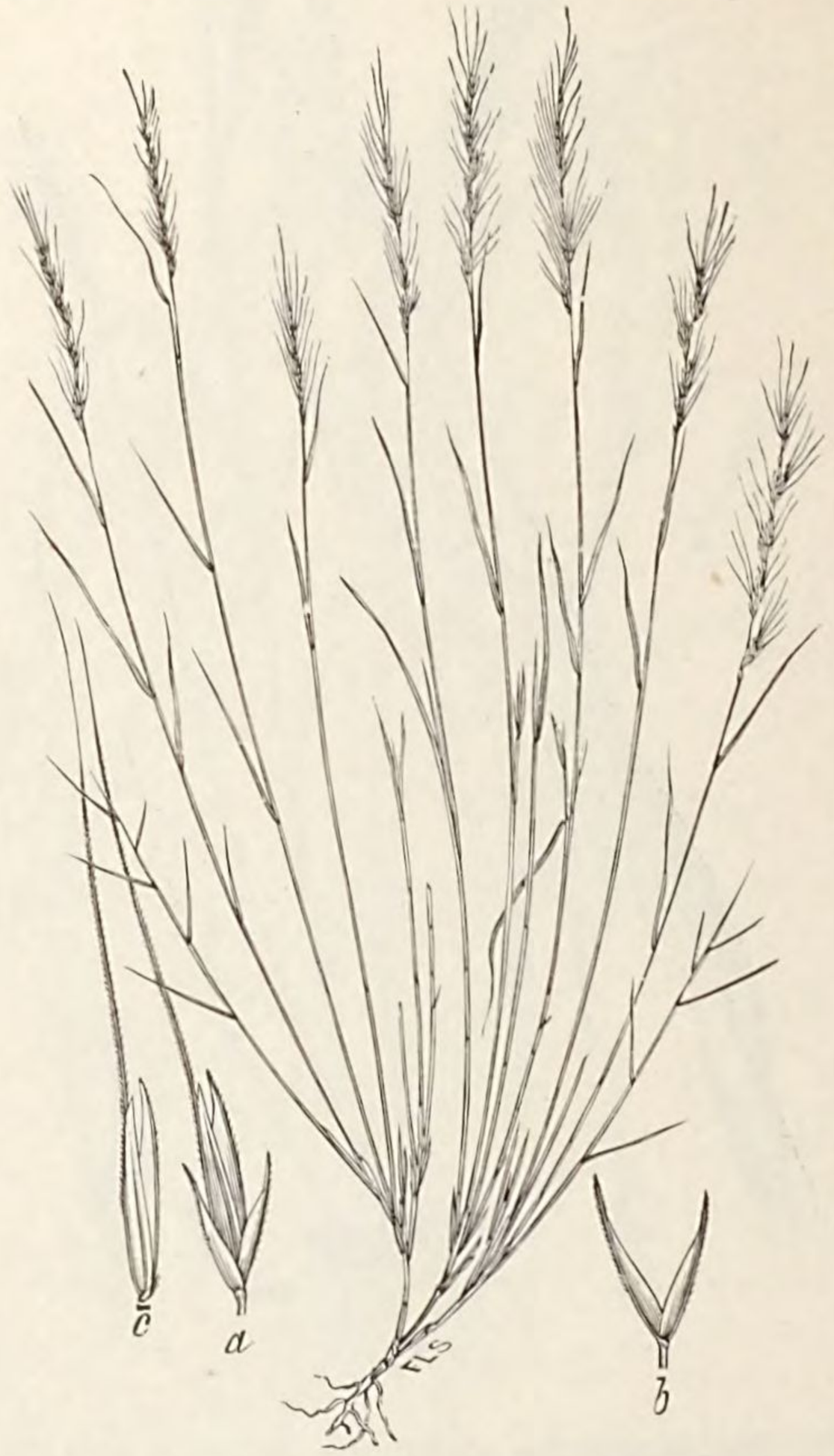

FIG. 104. **Muhlenbergia pringlei** Scribn.; Beal, Grasses N. Am., **2** : 257.—An erect, densely cæspitose, wiry perennial, with simple culms 3 to 4 dm. high, involute-filiform leaves and slender, contracted, often purplish panicles 6 to 10 cm. long.—Canyons, basins, and shaded ledges, mountains of New Mexico and Arizona. [Mexico.] May–September.

FIG. 105. **Muhlenbergia porteri** Scribn. in Beal, Grasses N. Am., **2** : 259 (*M. texana* Thurb. not Buckley).—A much-branched native perennial, with slender, somewhat wiry stems 3 to 6 dm. long, rather short, narrow leaves, and diffuse panicles. Valuable for grazing and for hay.—Dry mesas and table-lands, Texas to Arizona, Nevada, and California. [Mexico.] August, September.

FIG. 106. **Muhlenbergia gracillima** Torr.; Beal, Grasses N. Am., **2**: 261.—A densely tufted perennial, with slender culms 2 to 4 dm. high, numerous involute basal leaves and open capillary panicles 10 to 15 cm. long.—Dry plains, Kansas to Colorado, Texas, and Arizona. July-October.

FIG. 107. **Muhlenbergia pungens** Thurb.; Britton and Brown, Ill. Fl., **1**: 146.—A rigid, native perennial 3 to 4.5 dm. high, with firm, sharp-pointed leaves and open panicles about 15 cm. long.—Dry soil, sand hills and plains, Nebraska to Utah, Texas and Arizona. July–October.

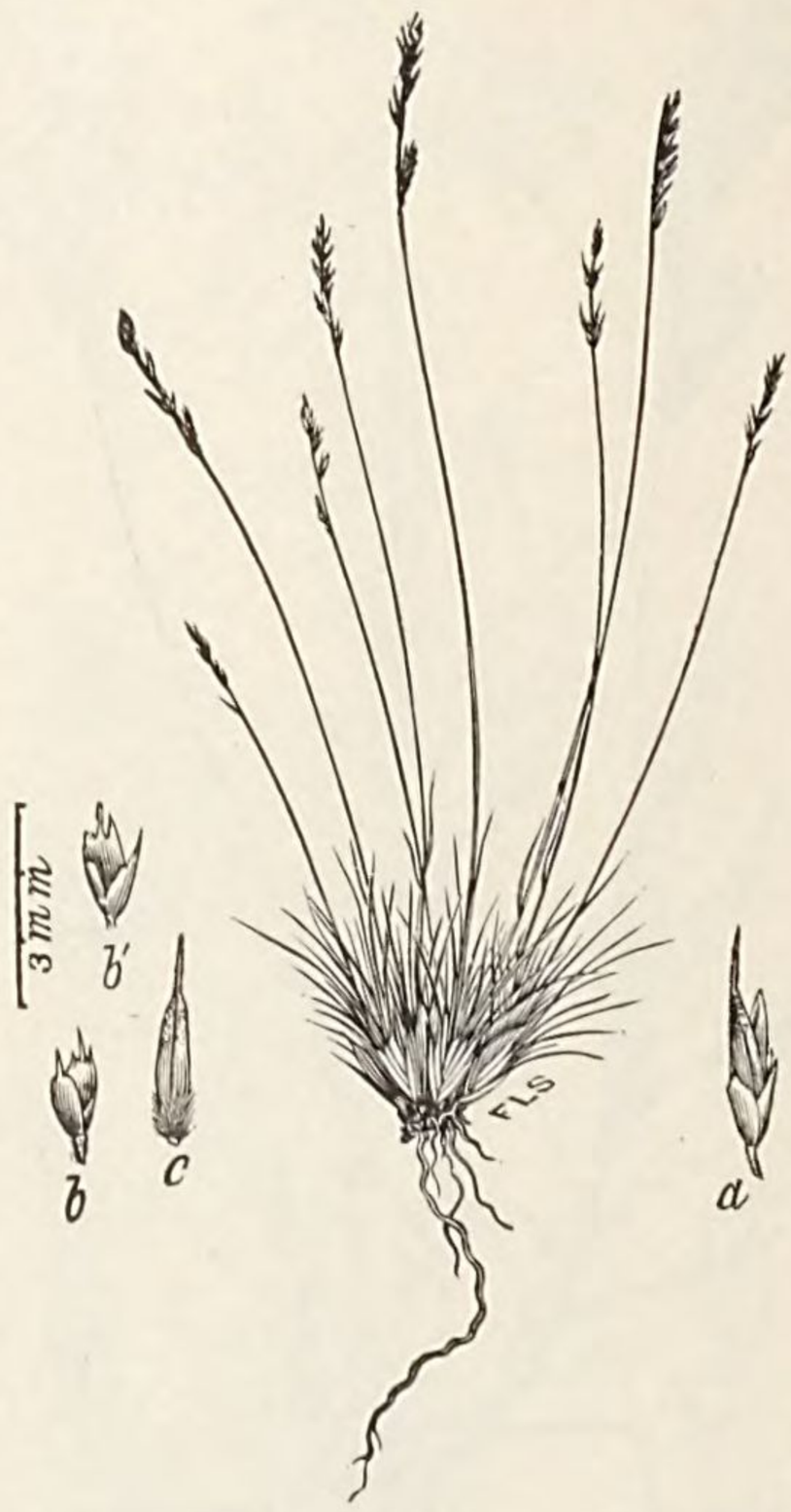

FIG. 108. **Muhlenbergia filiculmis** Vasey; Contrib. U. S. Nat. Herb. **1**: 267; Beal, Grasses N. Am., **2**: 250. THREAD-LIKE MUHLENBERGIA.—A low, tufted perennial with filiform scape-like culms 1.5 to 3.5 dm. high, setaceous radical leaves and narrow, spike-like panicles 2 to 5 cm. long.—Sandy soil, Ute Pass, El Paso County, in moist prairies at Como, Park County, and on the mesas at Twin Lakes, Lake County, Colorado; alt. 2,000 to 3,000 m. July–September.

FIG. 109. **Muhlenbergia schaffneri** Fourn; Beal, Grasses N. Am., **2**: 239.—A low, cæspitose, branching annual 2 to 10 cm. high, with short leaves and simple, spike-like panicles. Awn of the flowering glume 1 to 7 lines long.—"Dry, gravelly patches of thin soil," mountains of Arizona and New Mexico. [Mexico.] September.

FIG. 110. **Muhlenbergia virescens** (HBK.) Trin.; Beal, Grasses N. Am., **2**: 242.—A rather slender, erect perennial about 6 dm. high, with long, narrow leaves and a strict, pale-green or straw-colored panicle about 15 cm. long.—At an altitude of 1,800 to 2,400 m. on the mountains of Arizona and New Mexico. [Mexico.] May, June.

FIG. 111. **Muhlenbergia gracilis** Trin.; Beal, Grasses N. Am., **2**: 242.—A slender, but rather rigid, densely cæspitose perennial 1.5 to 6 dm. high, with narrow, involute leaves, and contracted panicles 8 to 15 cm. long.—Ascending to 2,700 m. or more. Texas to Arizona, Colorado, and Wyoming. [Mexico.] June–September.

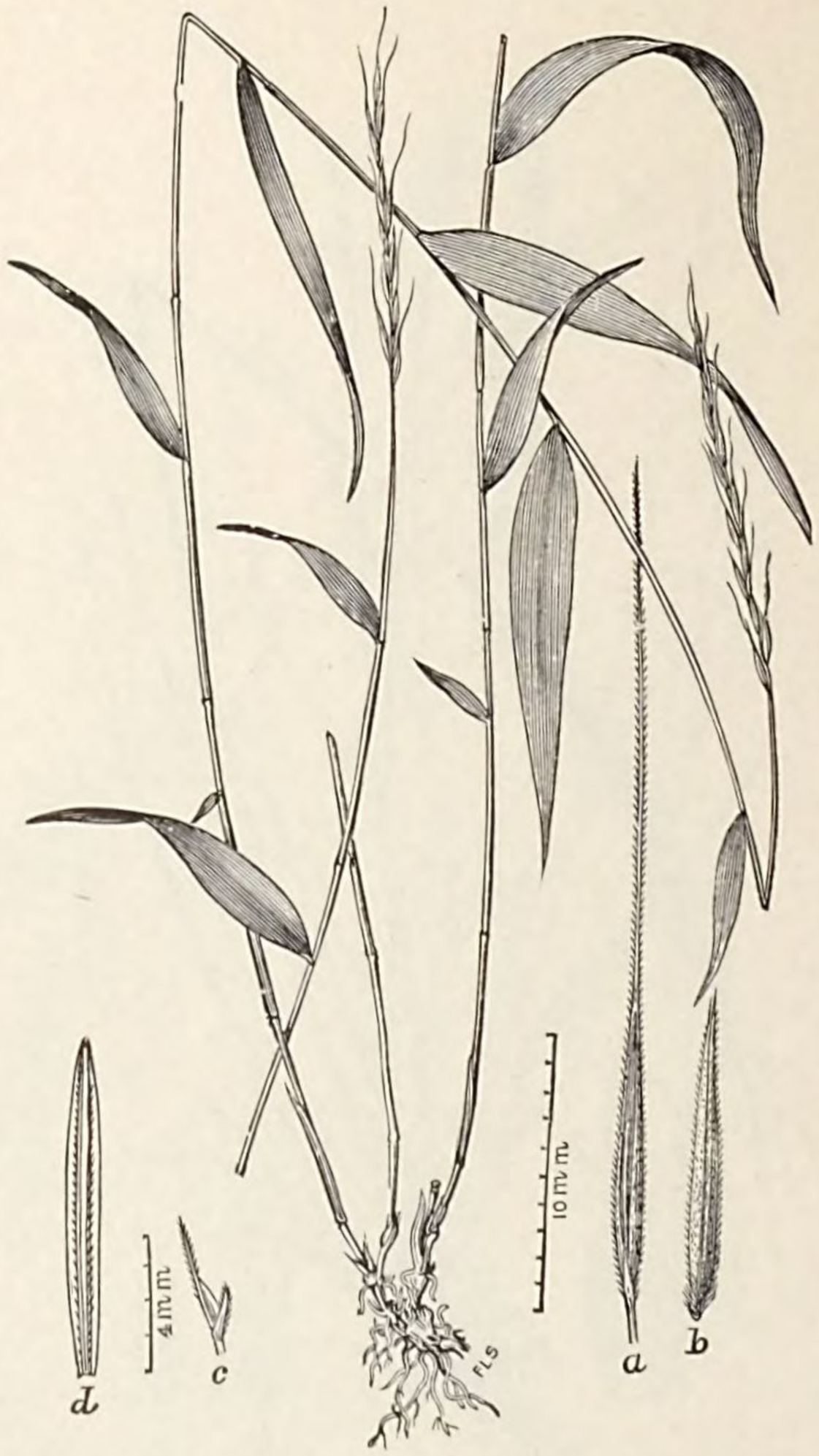

FIG. 112. **Brachyelytrum erectum** (Schreb.) Beauv. (*B. aristatum* R. & S.). BEARDED SHORT-HUSK.—A perennial, with simple culms 3 to 9 dm. high, flat, spreading leaf blades and few-flowered, simple, terminal panicles.—Open, rocky woods, Newfoundland to North Carolina, Alabama, Missouri, and Minnesota and Ontario. May–August.

FIG. 113. **Heleochloa schœnoides** (L.) Host (*Phleum schœnoides* L.; *Crypsis schœnoides* Lam.). RUSH-LIKE TIMOTHY.—A diffusely branching cæspitose annual 1 to 3 dm. high, with inflated sheaths, rather short, spreading leaves, and densely flowered ovate, or oblong, spike-like panicles.—Waste ground about New York City, Philadelphia, etc., sparingly naturalized. [Europe and Asia.] July, August.

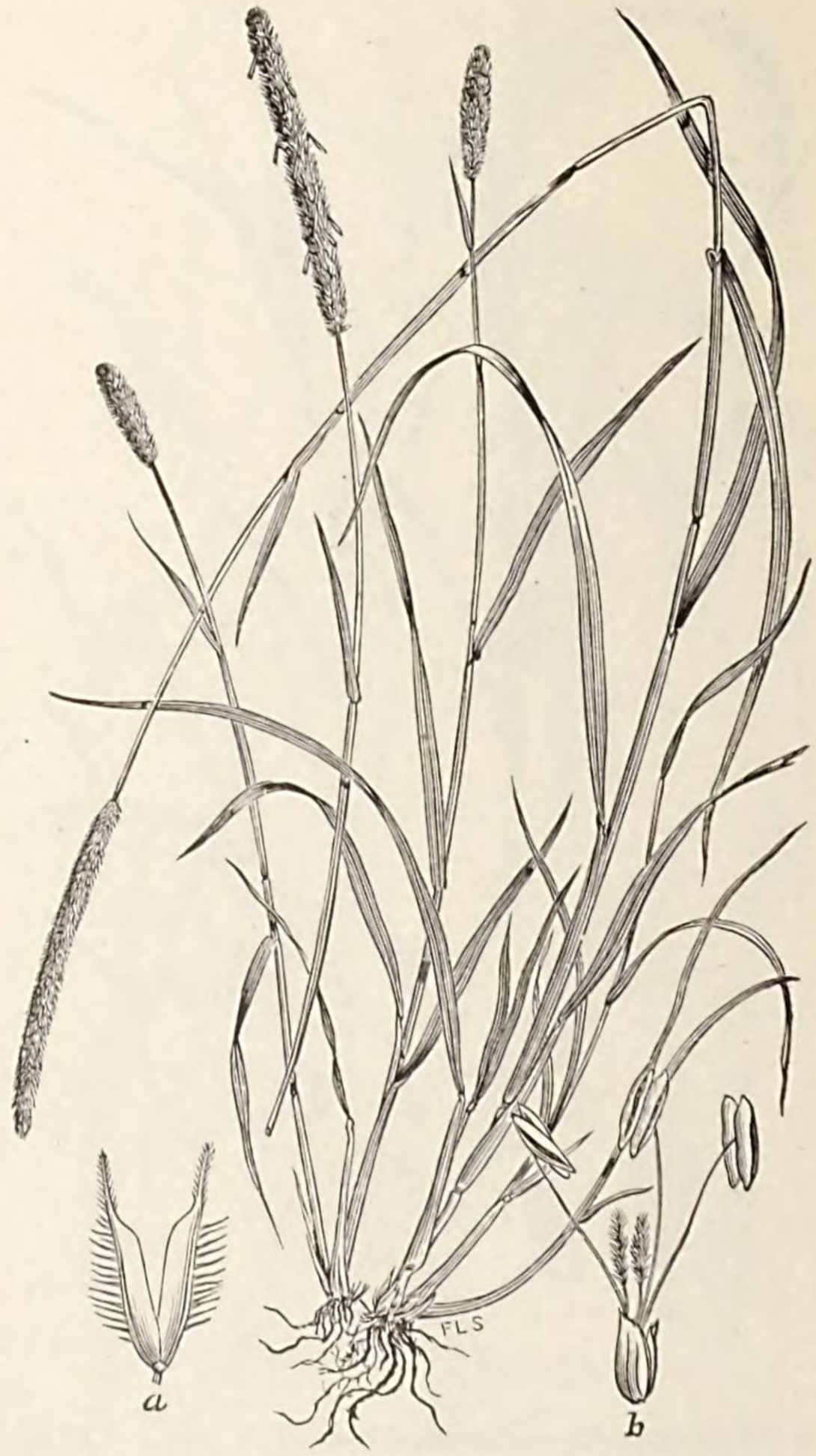

FIG. 114. **Phleum pratense** L. TIMOTHY.—A perennial with erect, simple culms 3 to 12 dm. high and dense, cylindrical, spike-like panicles 2.5 to 10 cm. long.—Widely cultivated and completely naturalized in fields, waysides, and waste ground throughout the United States and British America. [Europe and Asia.] June–August.

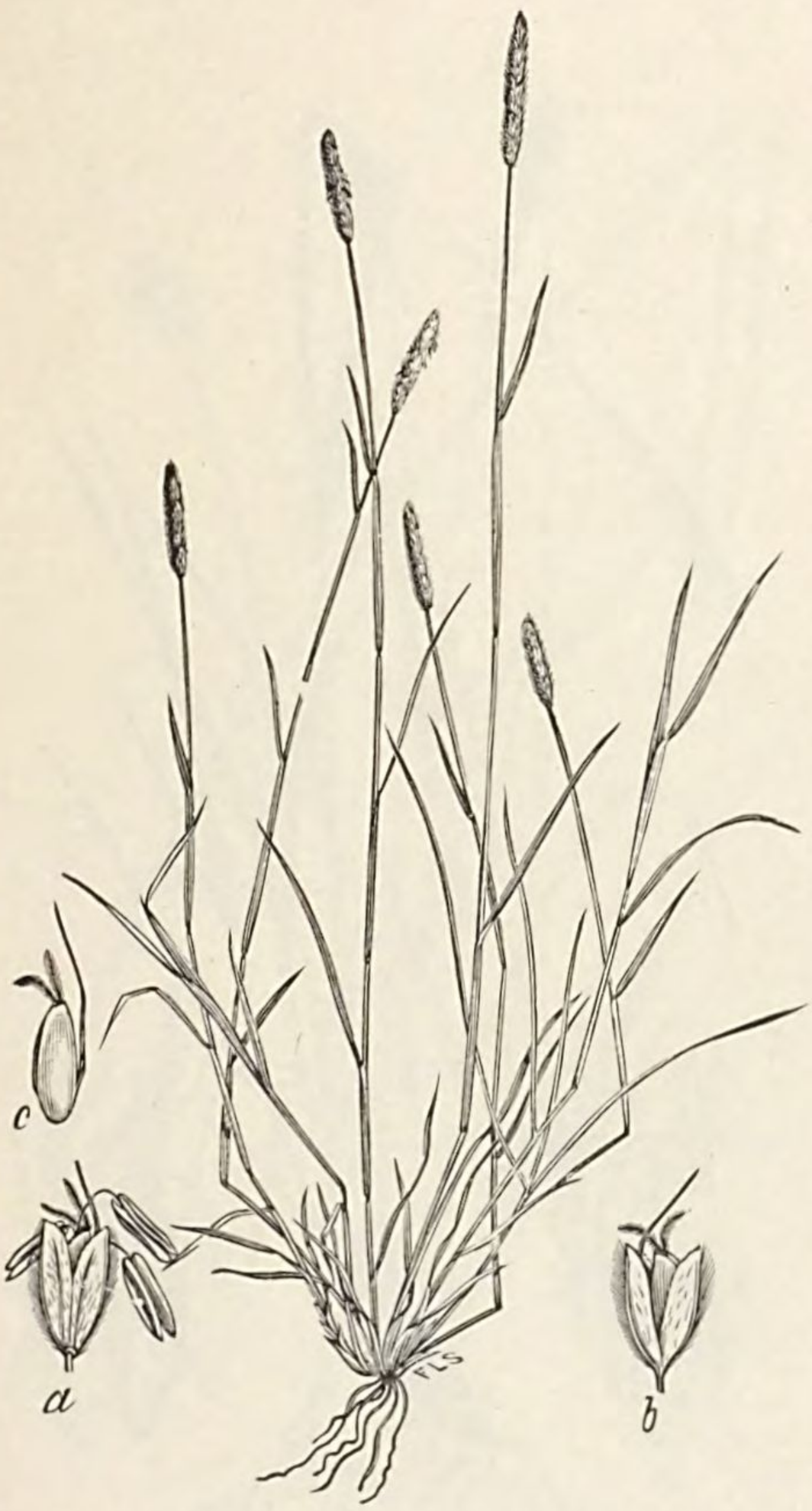

FIG. 115. **Alopecurus geniculatus** L. FLOATING FOXTAIL.—A slender perennial, with culms decumbent and branched at base, then erect or ascending, 1.5 to 6 dm. high, flat, spreading leaves and dense, spike-like, slender panicles 2.5 to 7.5 cm. long.—Wet meadows, banks of streams and ditches throughout the United States, and from Newfoundland to British Columbia. [Europe and Asia.] April–September.

FIG. 116. **Alopecurus pratensis** L. MEADOW FOXTAIL.—An erect, smooth perennial 3 to 9 dm. high, with short, creeping root-stocks, flat, spreading leaf blades, and dense, cylindrical, spike-like panicles 5 to 10 cm. long.—Naturalized in fields and meadows, Labrador to southern New York, Ohio and Michigan; also Oregon, Idaho, and California. [Europe, Asia, and Africa.] June, July.

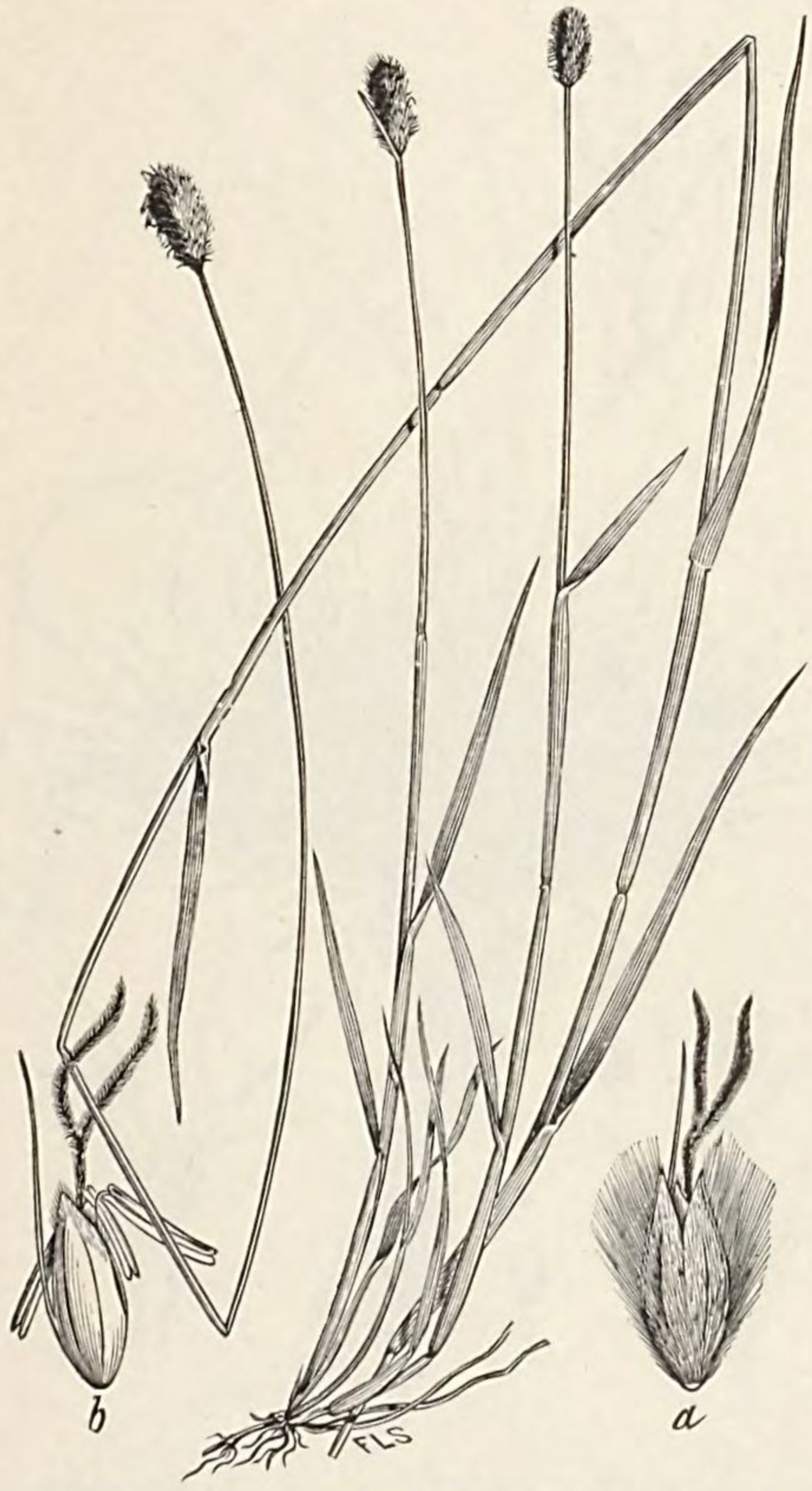

FIG. 117. **Alopecurus occidentalis** Scribn. (*A. pratensis alpestris* A. Gray). MOUNTAIN FOXTAIL.—An erect, rather slender grass 6 to 9 dm. high, with shorter and thicker heads than those of Meadow Foxtail.—Wet meadows and banks of streams, high mountains of Montana, Idaho, Wyoming, and Colorado. June–September. A valuable hay grass.

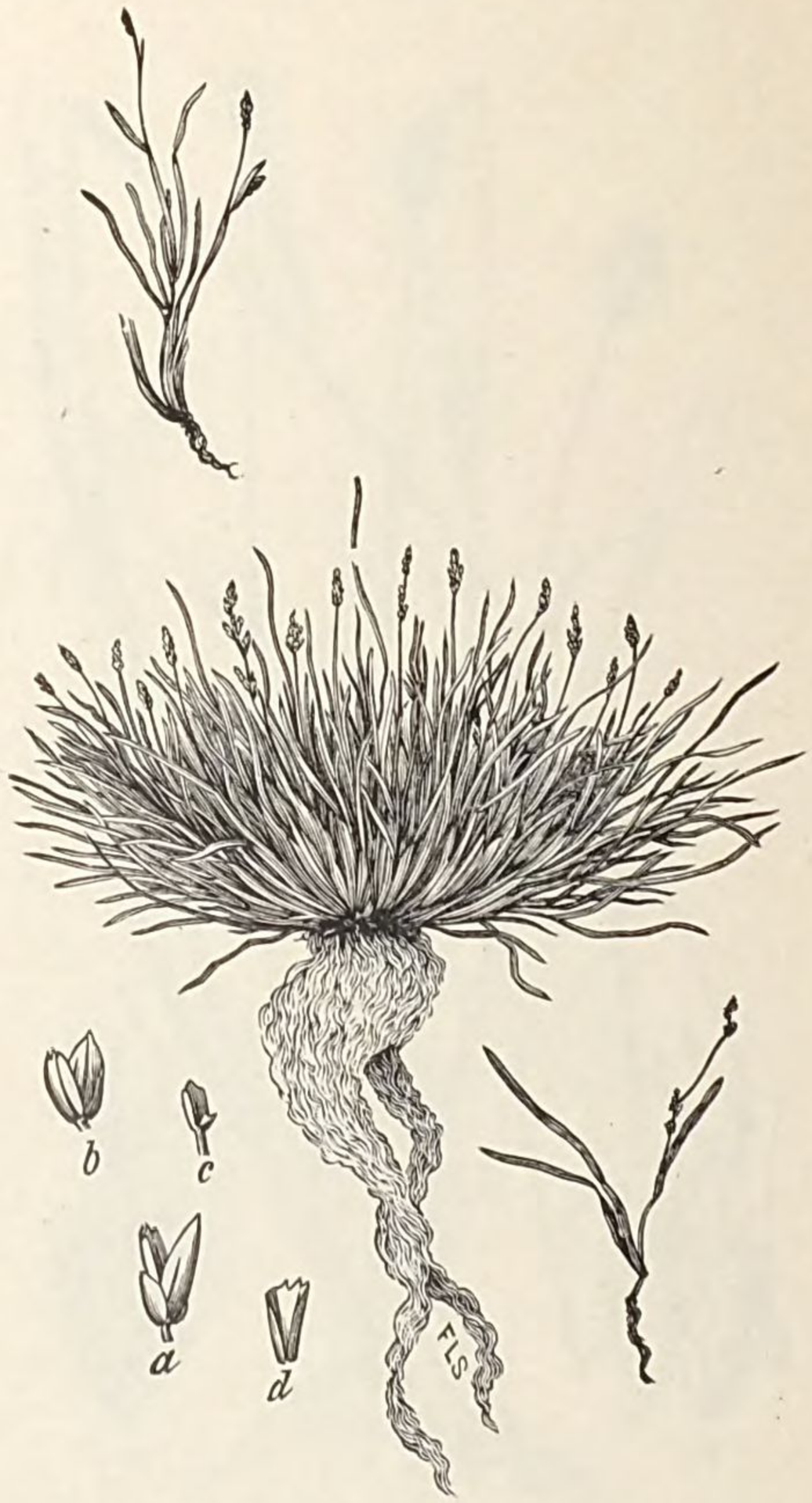

FIG. 118. **Phippsia algida** (Soland.) R. Br.; Britton and Brown, Ill. Fl., **1**: 150. PHIPPSIA.—A low, tufted, glabrous perennial 2 to 10 cm. high, with narrow, soft, and flat leaves and contracted, simple panicles.—Arctic North America and on the highest mountain peaks of Colorado. [Greenland, arctic Europe, and Asia.] July, August.

FIG. 119. **Sporobolus asper** (Michx.) Kunth (*Agrostis asper* Michx.). PRAIRIE-GRASS.—A rather slender perennial 3 to 9 dm. high, with usually long, involute-filiform leaf blades and contracted, linear panicles 5 to 15 cm. long.—In dry, sandy soil, open woods and glades, Long Island to Florida, west to Texas, Missouri, and Illinois. August-October. Avoided by stock excepting when young.

FIG. 120. **Sporobolus longifolius** (Torr.) Wood; Britton and Brown, Ill. Fl., **1**: 151. LONG-LEAFED SPOROBOLUS.—A stout perennial 3.5 to 10 dm. high, with very long, attenuate-pointed leaves, and strict, spike-like panicles 3 to 10 inches long, which are more or less included in the inflated leaf sheaths.—Dry, sandy soil, Maine to Pennsylvania, South Dakota and Utah, south to Texas and Florida. August–October.

FIG. 121. **Sporobolus heterolepis** A. Gray. STRONG-SCENTED SPOROBOLUS.—A rather stout, somewhat wiry, cæspitose perennial 6 to 9 dm. high, with very long basal leaves and loose, open panicles.—In dry soil, prairies, etc., Connecticut to Quebec, Iowa and Nebraska and Wyoming, thence south to Texas and north to Assiniboia and Saskatchewan. August, September.

FIG. 122. **Sporobolus interruptus** Vasey; Beal, Grasses N. Am., **2** : 286.—A rather stout, erect perennial with simple culms about 4 dm. high, flat leaves and narrow but loosely flowered panicles 10 to 18 cm. long.—In forests, mountains of Arizona. August, September.

FIG. 123. **Sporobolus floridanus** Chapm.—A rather stout, erect perennial 6 to 12 dm. high, with long, narrow leaves and diffuse panicles 2.5 to 5 cm. long. Pedicels capillary; spikelets purplish.—Moist pine barrens near the coast, North Carolina to western Florida. July–September.

FIG. 124. **Sporobolus curtissii** (Vasey) Small. (*S. floridanus curtissii* Vasey; Beal, Grasses N. Am., **2**: 290).—A wiry, erect perennial 3 to 6 dm. high, with very long leaves and loosely flowered, open panicles 15 to 25 cm. long.—Moist pine barrens, northeastern Florida. July–November.

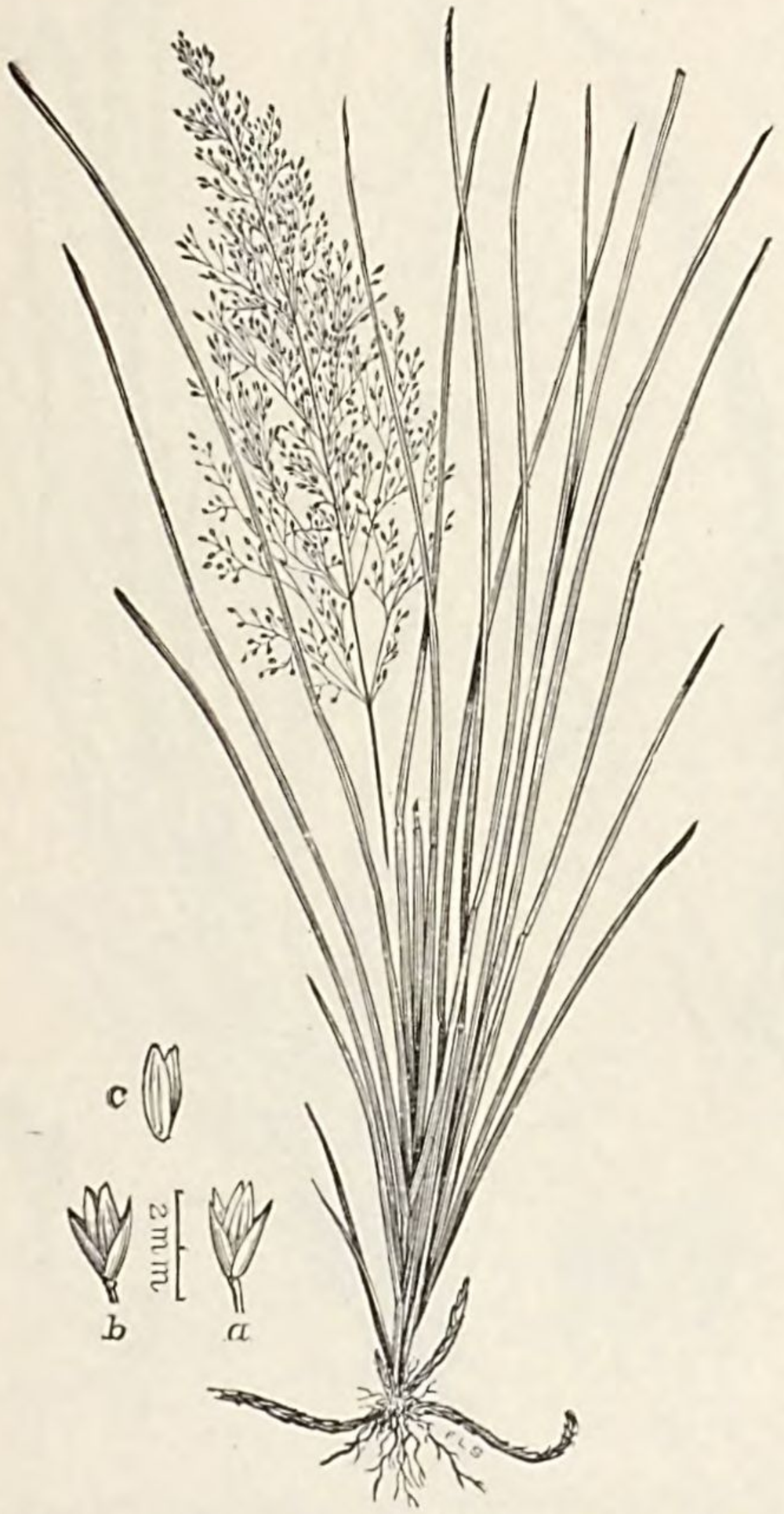

FIG. 125. **Sporobolus compressus** (Torr.) Kunth. (*Agrostis compressa* Torr.). FLAT-STEMMED SPOROBOLUS.—A cæspitose perennial, with short, scaly rootstocks, flattened culms 3 to 6 dm. high, rather long, conduplicate leaves and open, capillary panicles 10 to 30 cm. long.—In bogs and pine barrens, Long Island and New Jersey. September, October.

FIG. 126. **Sporobolus indicus** (L.) R. Br. SMUT-GRASS.—A tufted, wiry, erect perennial 3 to 9 dm. high, with simple culms and narrow, densely flowered, spike-like panicles 10 to 30 cm. long.—Abundantly naturalized in waste ground, waysides, fields, and pastures, Virginia and Tennessee to Florida, Arkansas, Texas, and California; occasional in the Eastern cities. [Native or naturalized in all tropical countries.] March–September.

FIG. 127. **Sporobolus airoides** Torr. FINE-TOP SALT-GRASS.—A stout, coarse, and rigid perennial 3 to 9 dm. high, with long, narrow leaves and open, spreading panicles of many small spikelets.—Moist or dry, usually saline or alkaline soil in deserts, prairies, along streams, in meadows, etc., Nebraska and Kansas to Idaho, California, Texas, and Arizona. [Mexico and Lower California.] July-September.

FIG. 128. **Sporobolus argutus** (Nees) Kunth (*Vilfa arguta* Nees.); Beal, Grasses N. Am., **2**: 301.—A cæspitose perennial 2 to 4 dm. high, with flat leaves and open (at first strict) panicles 3 to 5 cm. long.—"Sand dunes and sandy flats near river banks," Kansas and Colorado to Texas and western Louisiana, also in southern Florida. [Mexico and West Indies.] May–September.

FIG. 129. **Sporobolus confusus** (Fourn.) Vasey; Beal, Grasses N. Am., **2**: 294.—A slender, branching, tufted annual 0.8 to 2 dm. high, with loose sheaths, flat leaves, and capillary, ovoid or oblong panicles 8 to 15 cm. long.—Sandy banks of streams, moist places in sandy plains, canyons, etc., Texas to California, and in Colorado and Montana. [Mexico.] July–September.

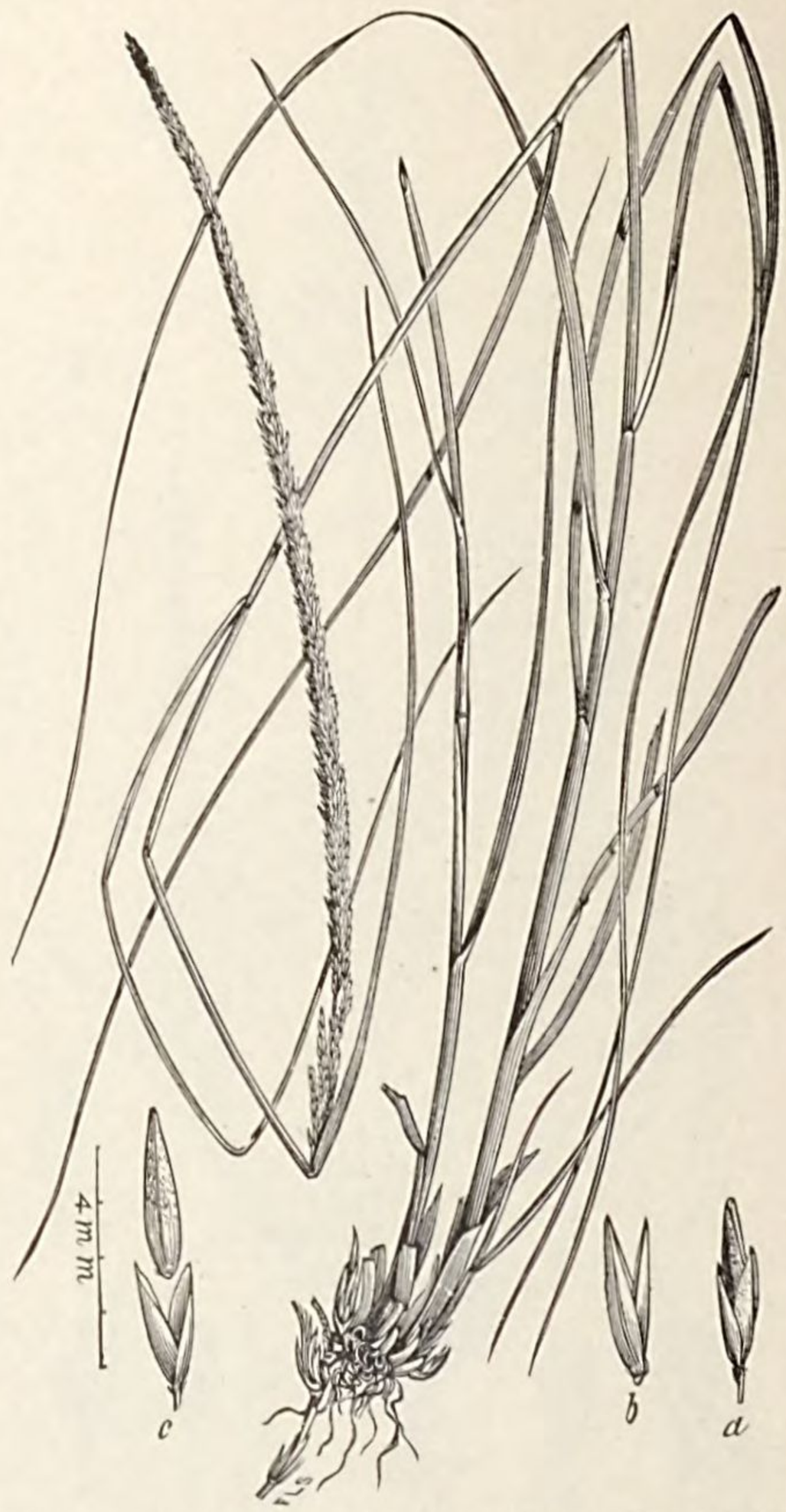

FIG. 130. **Epicampes rigens** (Boland.) Benth.; Beal, Grasses N. Am., **2**: — (*Cinna macroura* Thurb. not Kunth; *Vilfa rigens* Boland. not Trin.). DEER-GRASS.—A stout, erect perennial, with rigid, wiry culms 9 to 12 dm. high; long, narrow leaves and very long, narrow, and densely flowered spike-like panicles.—In the foothills, Texas to Nevada, New Mexico, Arizona, and southern California. [Mexico.] July–November. A bunch-grass of some agricultural value.

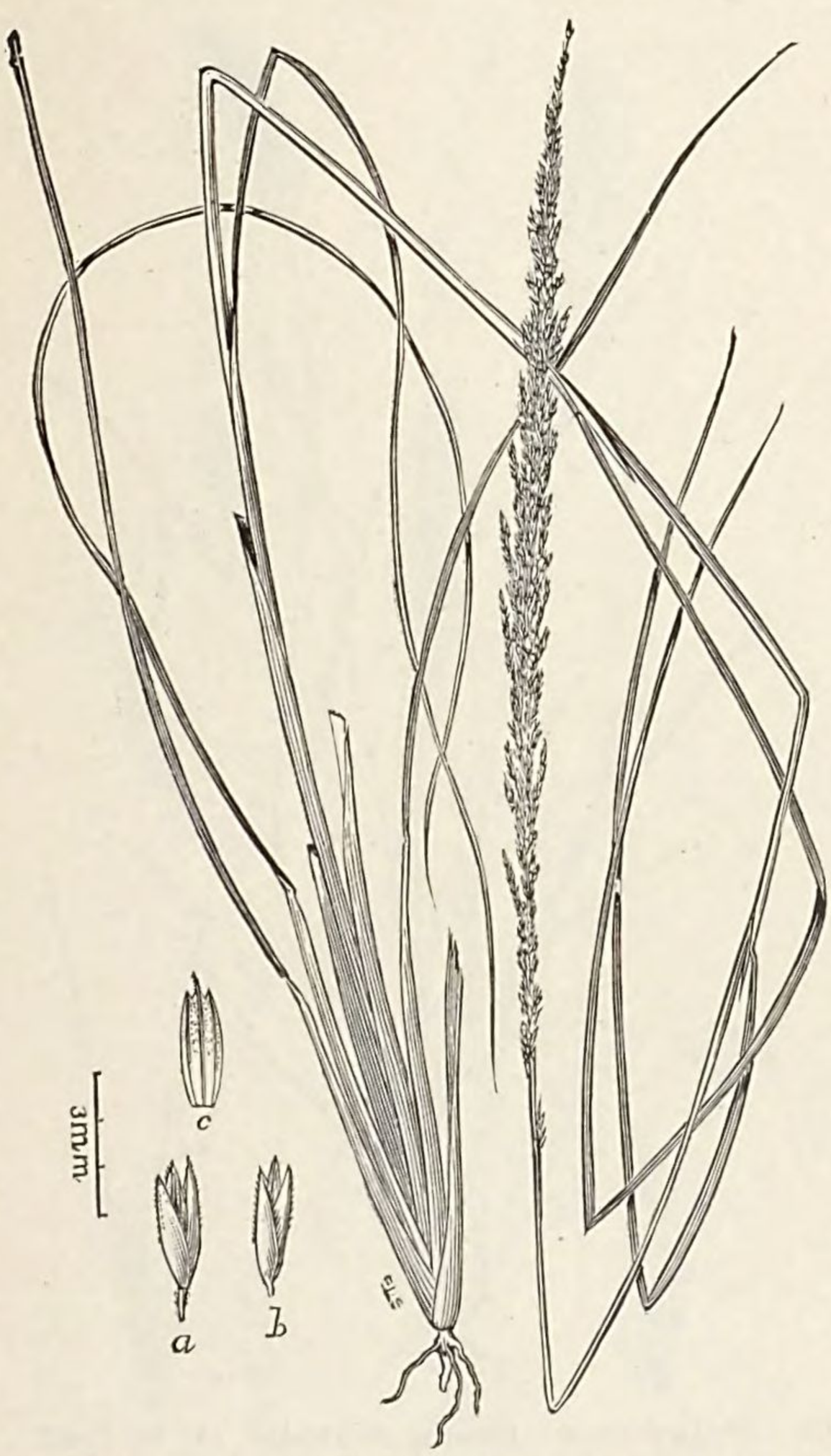

FIG. 131. **Epicampes ligulata** Scribn. sp. nov.—A stout, rigid perennial 6 to 12 dm. high, with narrow, very scabrous leaves and strict, rather densely flowered panicles 20 to 40 cm. long. Leaves long-attenuate pointed, rigid, and subinvolute at the base, where they are much narrower than the rigid ligule, which is 10 to 30 mm. long. Spikelets dark purple, glumes subequal.—Cool slopes and canyons, mountains of New Mexico and Arizona. [Mexico.] August, September.

FIG. 132. **Polypogon monspeliensis** (L.) Desf. BEARD-GRASS.—A smooth annual from a few centimeters to 6 to 9 dm. high, with awned 1-flowered spikelets crowded in dense spike-like panicles.—In fields and waste places, sparingly naturalized along the Atlantic Coast from New Hampshire to South Carolina; abundantly on the Pacific Slope from California to Vancouver Island, and in Arizona, Nevada, and Colorado. [Europe and Asia.] April–October.

FIG. 133. **Limnodia arkansana** (Nutt.); Dewey in Contrib. U. S. Nat. Herb., **2**: 518 (*Greenia arkansana* Nutt.; *Thurberia arkansana* Benth.).—A slender annual 2 to 6 dm. high, more or less geniculate at the lower nodes, with soft, flat leaves and narrow, loosely flowered panicles 8 to 18 cm. long. Outer glumes scabrous or pilose.—Shell banks, woods, etc., western Florida to Arkansas and southern Texas. April–June.

FIG. 134. **Cinna arundinacea** L. INDIAN REED.—A tall, leafy grass 9 to 21 dm. high, with simple culms, flat leaf blades, and ample terminal panicles.—Shaded swamps, banks of streams and low thickets, Newfoundland to North Carolina, Alabama, Texas, South Dakota, and the Northwest Territory. May–September.

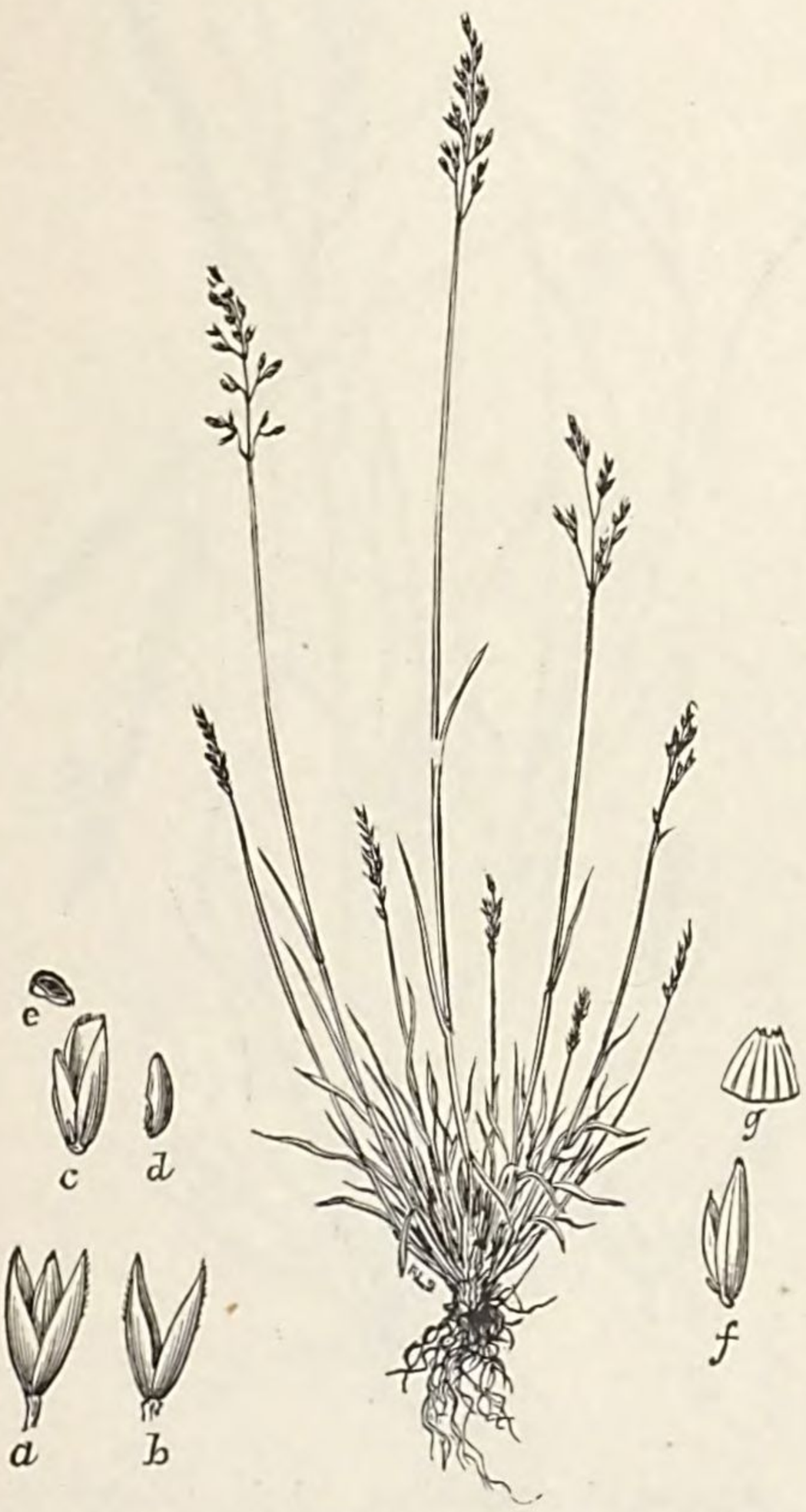

FIG. 135. **Agrostis humilis** Vasey (*A. varians* Trin.? not Thuill.). —A dwarf, slender perennial 6 to 12 cm. high, with short, flat leaves and contracted, purplish panicles 2 to 3 cm. long.—Moist meadows, or mossy and springy places, at 2,100 to 3,000 m. altitude on the mountains of Colorado, Wyoming, Washington, Oregon, and Montana. August, September.

FIG. 136. **Agrostis coarctata** Ehrh. (*Stolonifera coarctata* Reichb).—A creeping perennial with slender culms, the upright branches about 3 dm. high, short, flat leaves and narrow, rather densely flowered panicles 5 to 10 cm. long.—Damp soil and sands along the coast, Newfoundland to New Jersey. [Europe.] July–October. A fine-leafed, excellent turf-forming species, valuable for lawns.

FIG. 137. **Agrostis densiflora** Vasey; Contrib. U. S. Nat. Herb., **3**: 72 (1892); Beal, Grasses N. Am., **2**: 326. DENSELY-FLOWERED BENT.—A rather stout, cæspitose perennial 1.5 to 4.5 dm. high, with short and comparatively broad leaves and densely, many-flowered, almost spike like panicles 3 to 8 cm. long.—Oregon and California, along the coast, apparently rare. July, August.

FIG. 138. **Agrostis pringlei** Scribn. sp. nov.—A strongly stoloniferous grass, with rather slender, upright or ascending culms 3 to 6 dm. high, narrow and rather rigid flat leaves, and loosely flowered, narrow panicles 5 to 15 cm. long. Flowering glumes much shorter than the acuminate outer ones, and remarkable for the long hairs on the callus.—Plains, Mendocino County, California (Pringle), and northward to Oregon (?). August.

FIG. 139. **Agrostis diegoensis** Vasey (*A. foliosa* Vasey); Beal, Grasses N. Am., **2**: 328.—A strong-growing, leafy perennial 6 to 10 dm. high, from creeping rootstocks, with pale-green, narrow, and many-flowered panicles 15 to 20 cm. long. Spikelets 2 to 3 mm. long; flowering glume short-awned or awnless; palea wanting.—Mountains of southern California to Washington. May–August.

FIG. 140. **Agrostis elliottiana** Schult. (*A. arachnoides* Ell.). SPIDER BENT-GRASS.—A low, branching annual, rarely exceeding 3 dm. high, with narrow, flat leaves and diffuse, capillary panicles. The flowering glume bears a long and very slender awn.—Dry hillsides and old fields, South Carolina to Kentucky and Missouri, south to Florida and Texas. April, May.

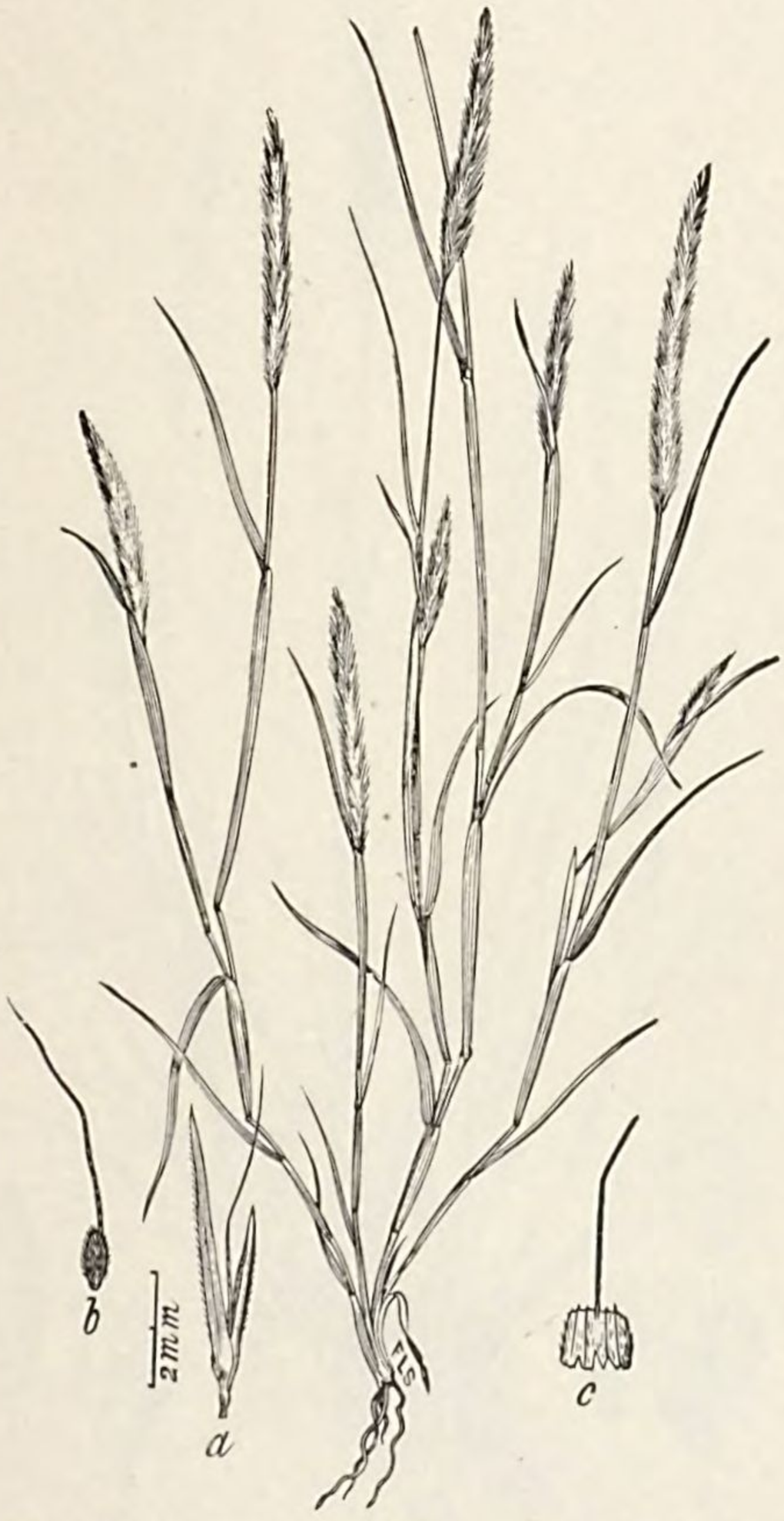

FIG. 141. **Gastridium lendigerum** (L.) Gaudin. (*G. australe* Beauv.; *Milium lendigerum* Linn.). NIT-GRASS.—A smooth annual 1.5 to 6 dm. high, with flat leaves and a strict, spike-like panicle 6 to 12 cm. long; cultivated for ornament.—Hills, naturalized, California and Oregon; also in Texas. [Southern Europe.] June, July.

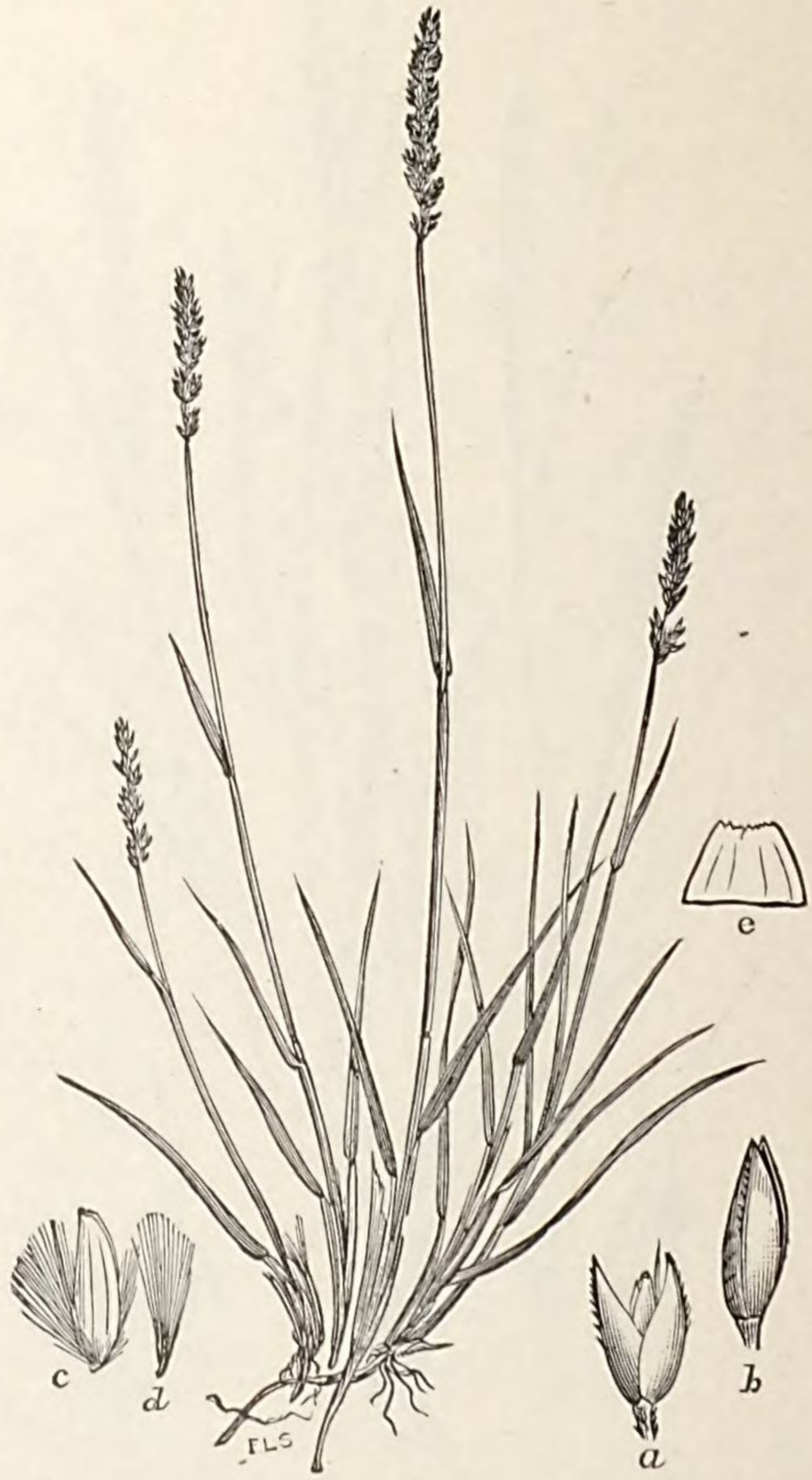

FIG. 142. **Calamagrostis crassiglumis** Thurb.; Beal, Grasses N. Am., **2**: 353 (as a var. of *C. neglecta*).—A rigid, erect perennial 1.5 to 4 dm. high, from creeping rootstocks, with long basal leaves and dense, oblong, spike-like panicles 4 to 6 cm. long.—Wet ground and gravelly lake shores, California to Vancouver Island. July, August.

FIG. 143. **Calamagrostis breviseta** (A. Gray) Scribn.; Britton and Brown Ill. Fl., **1**: 164 (*C. pickeringii* A. Gray). SHORT-AWNED REED-GRASS.—A slender perennial 3 to 5 dm. high, with flat leaves and narrow or subpyramidal, rather densely flowered purplish panicles 8 to 12 cm. long.—Moist ground, Newfoundland, Cape Breton Island, and Labrador to New Hampshire, Vermont, and Massachusetts. July, August.

FIG. 144. **Calamagrostis deschampsioides** Trin.; Beal, Grasses N. Am., **2**: 339.—A slender perennial with culms 1.5 to 3 dm. high, from creeping rootstocks, with narrow leaves 3 to 7 cm. long and open, pyramidal panicles 4 to 8 cm. long.—Pribilof Islands, Alaska, southward to California. [Kamchatka.] August.

FIG. 145. **Calamagrostis aleutica** Trin.; Beal, Grasses N. Am., **2** : 346.—A stout, erect perennial 6 to 15 dm. high, with long and rather stiff, flat leaves and densely many-flowered, narrow panicles 15 to 30 cm. long.—Along the seashore, in rocky or marshy places, Alaska and Unalaska to California. June-September.

FIG. 146. **Calamagrostis tweedyi** Scribn.; Beal, Grasses N. Am., **2**: 348.—A stout perennial 7 to 10 dm. high, with rather broad, flat leaves and densely flowered, spike-like panicles 8 to 12 cm. long.—Cascade Mountains, Washington.

FIG. 147. **Calamagrostis bolanderi** Thurb.; Beal, Grasses N. Am., **2**: 352.—A stout perennial 6 to 15 dm. high, with flat leaves 10 to 30 cm. long and expanded, dark-purple panicles 8 to 20 cm. long.—Moist woodlands, northwestern California. August.

FIG. 148. **Calamagrostis howellii** Vasey; Beal, Grasses N. Am., **2**: 339.—A densely cæspitose, erect, leafy perennial 2.5 to 5 dm. high, with long and narrow basal leaves and open panicles 8 to 15 cm. long. Spikelets long-awned.—High mountains, Oregon and Washington. June–August.

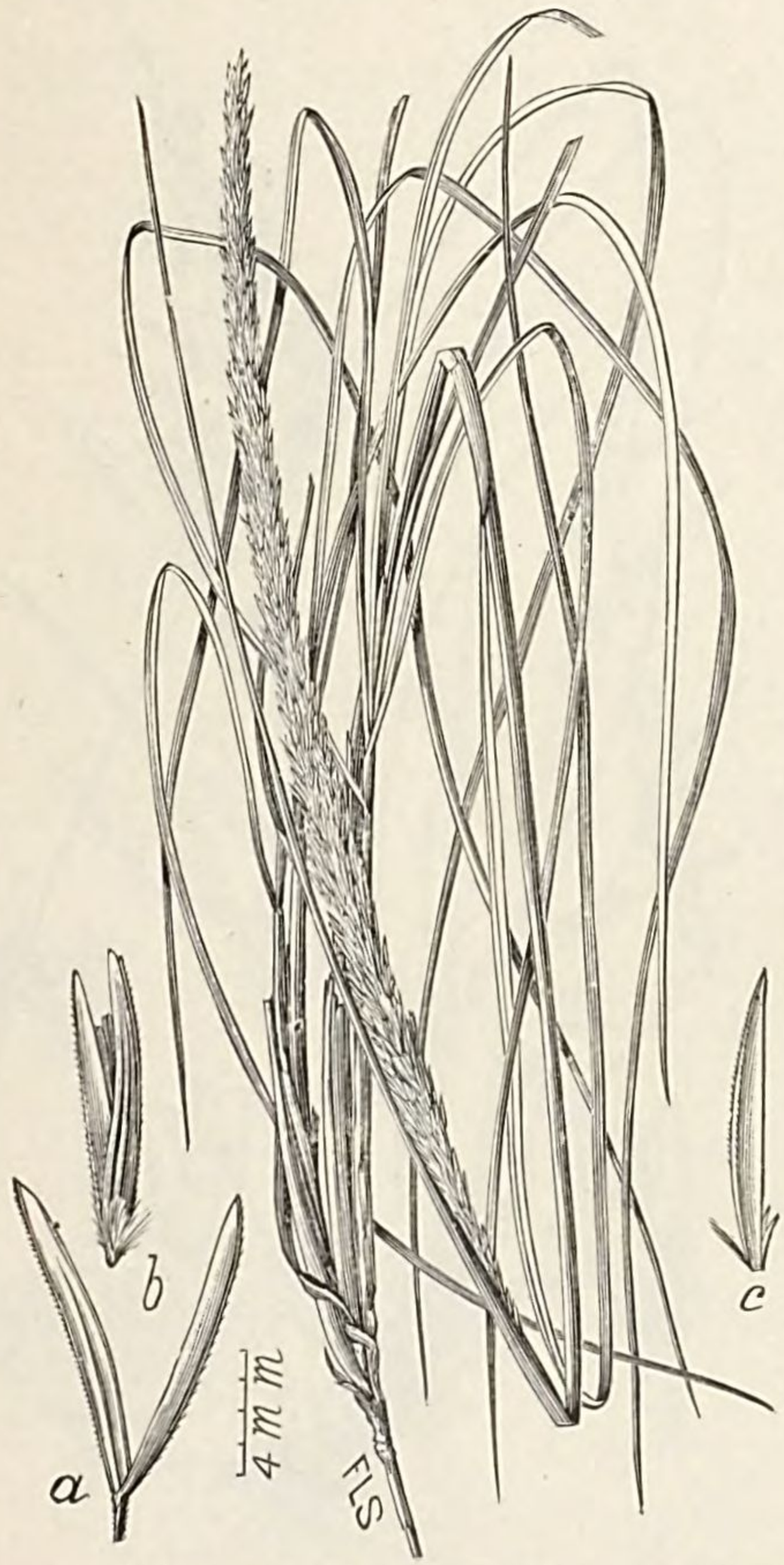

FIG. 149. **Ammophila arenaria** (L.) Link (*A. arundinacea* Host.). BEACH-GRASS, MARRAM-GRASS.—A coarse, erect perennial, with creeping rootstocks, rigid culms 6 to 12 dm. high, long leaves, and narrow, densely flowered, spike-like terminal panicles 12 to 25 cm. long.—Sandy coasts of the Atlantic from New Brunswick south to Virginia, and shores of the Great Lakes. [Europe.] July–October.

FIG. 150. **Calamovilfa brevipilis** (Torr.) Scribn. (*Arundo brevipilis* Torr.). SHORT-HAIRED REED-GRASS.—A rather slender, smooth perennial 9 to 12 dm. high, with very narrow leaves and open panicles 8 to 24 cm. long.—Sandy swamps in the pine barrens of New Jersey. August, September.

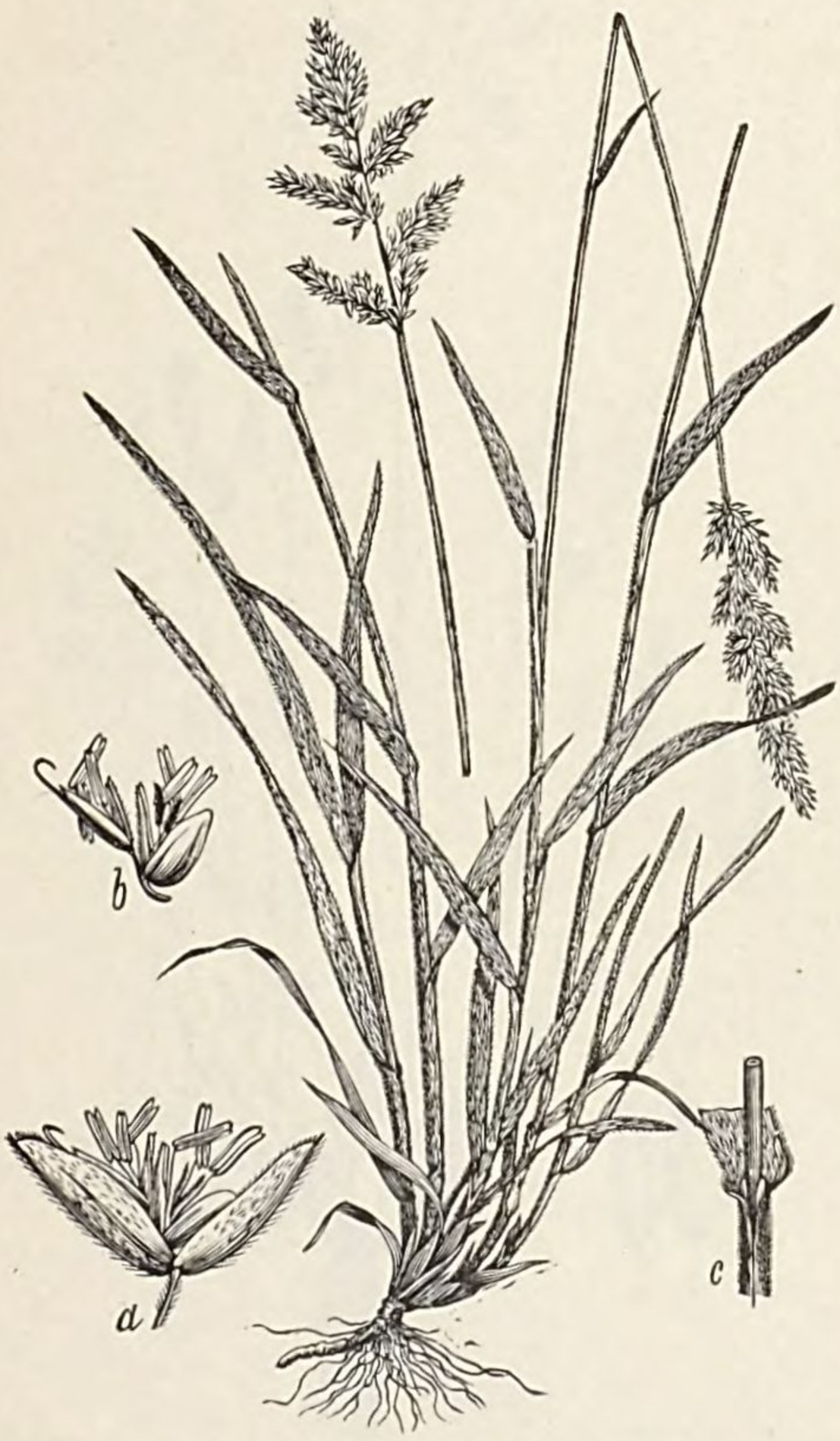

FIG. 151. **Holcus lanatus** L. VELVET GRASS.—A perennial 3 to 6 dm. high, with creeping rootstocks, flat leaves, and open panicles 5 to 8 cm. long; usually densely pubescent all over with soft, whitish hairs.—Introduced into this country from Europe with other grasses and now widely distributed. May–August.

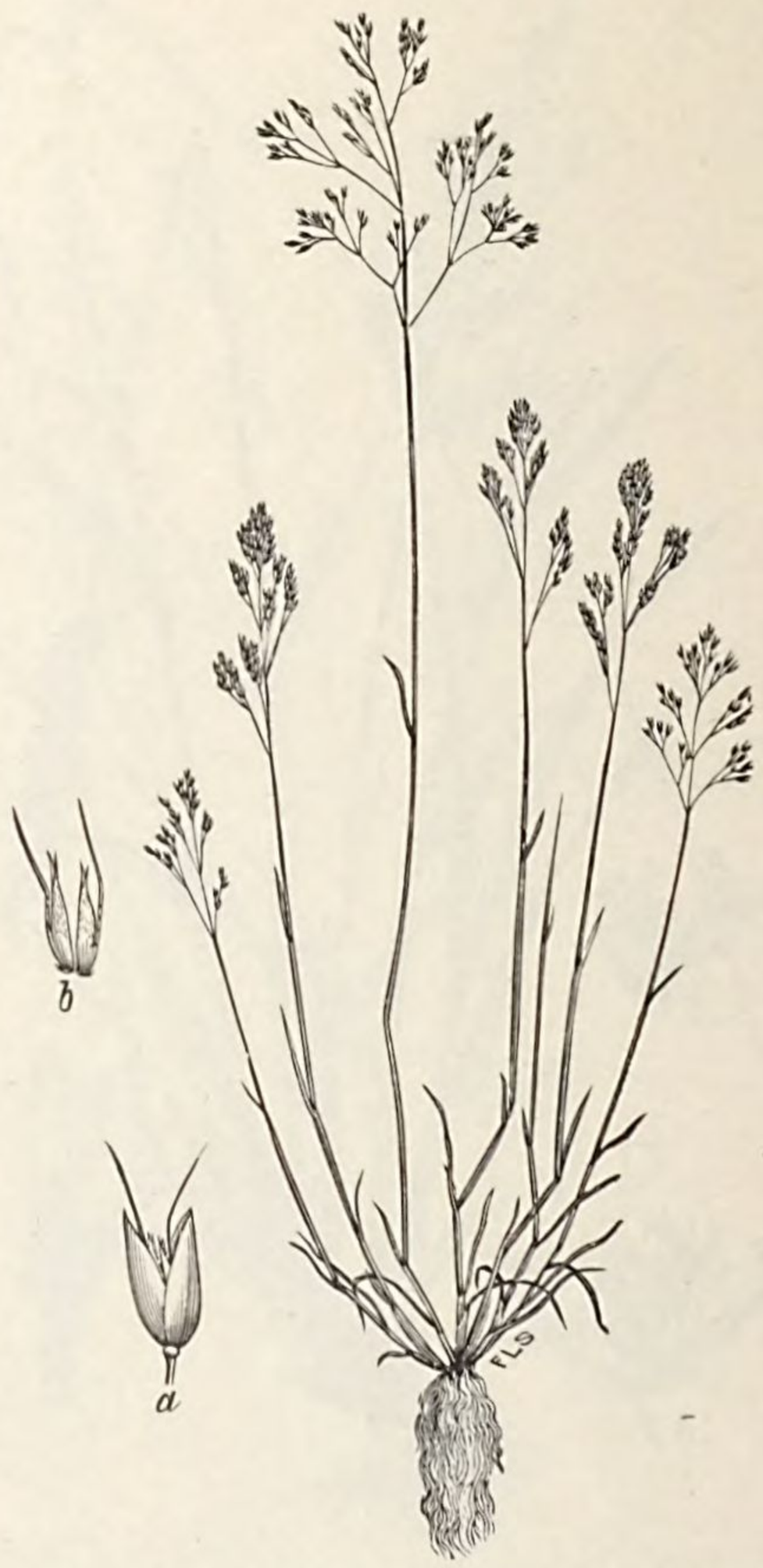

FIG. 152. **Aira caryophyllea** L. SILVERY HAIR-GRASS.—A slender, tufted annual 1 to 3 dm. high, with short leaves and small-flowered, open panicles 2 to 8 cm. long.—In sandy waste places, Massachusetts to Virginia; also on the Pacific Coast. Introduced from Europe. May–August.

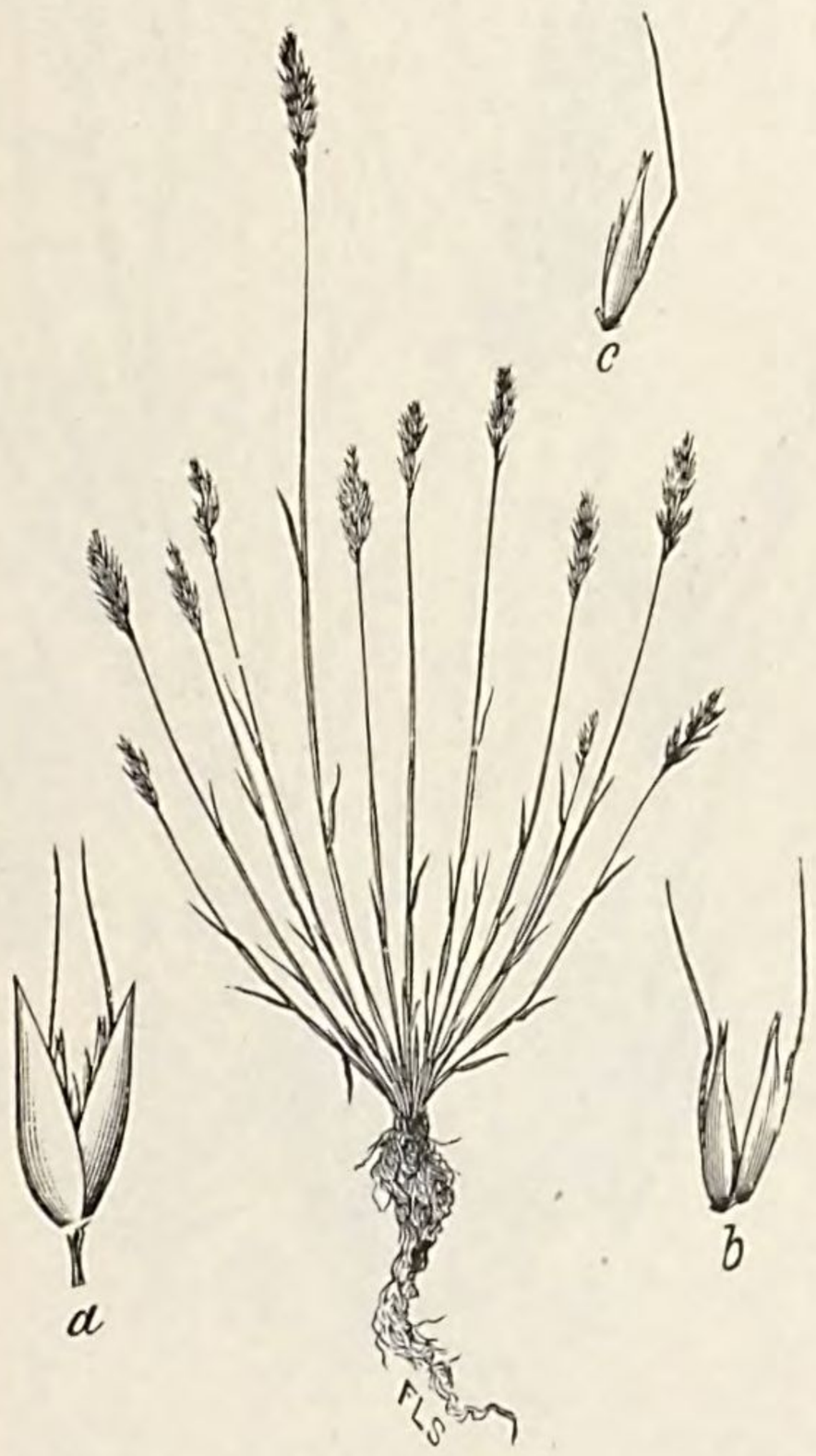

FIG. 153. **Aira præcox** L. EARLY WILD OAT-GRASS.—A tufted, erect or ascending annual 2 to 12 cm. high, with a contracted panicle 1 to 2 cm. long.—Introduced and sparingly distributed in the Middle States near the coast, growing in sandy soil. Also on Vancouver Island. [Europe.] May–July.

FIG. 154. **Deschampsia holciformis** Presl.; Beal, Grasses N. Am., **2**: 370. CALIFORNIAN HAIR-GRASS.—A stout, erect perennial 6 to 15 dm. high, with long and rather rigid basal leaves and densely flowered, more or less interrupted panicles 12 to 24 cm. long.—Moist meadows, California near the coast. **April.**

FIG. 155. **Deschampsia flexuosa** (L.) Trin. TUFTED HAIR-GRASS.—A slender, erect perennial about 6 dm. high, with involute-setaceous, radical leaves and diffuse panicles.—Labrador southward along the mountains to North Carolina and Tennessee, and westward from New York to Wisconsin. [Greenland and Europe.] May–August.

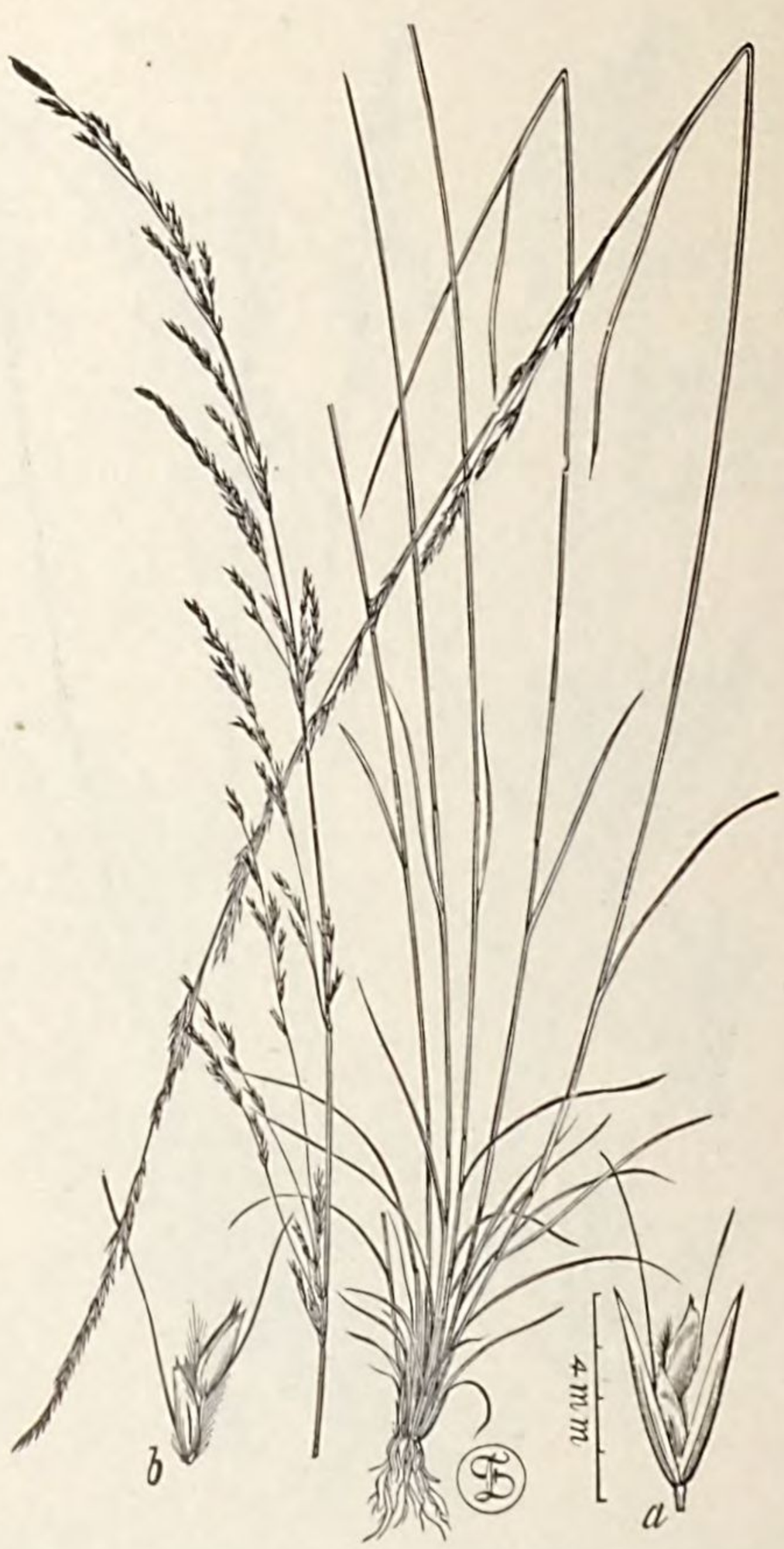

FIG. 156. **Deschampsia elongata** (Hook.) Munro; Beal, Grasses N. Am., **2**: 371. SLENDER HAIR-GRASS.—A slender perennial 3 to 12 dm. high, with narrow panicles 15 to 38 cm. long.—Montana to British Columbia and southward on the Pacific Slope to Mexico. May-August.

FIG. 157. **Deschampsia calycina** Presl (*Aira danthonioides* Trin.). OAT-LIKE HAIR-GRASS.—A rather slender, erect, cæspitose grass from 1 to 7 dm. high, with more or less spreading panicles.—Native along the Pacific Slope from Canada to California, eastward to Utah, and southward through Mexico to Peru. April-July.

FIG. 158. **Deschampsia atropurpurea** (Wahl.) Scheele. MOUNTAIN HAIR-GRASS.—A slender, alpine grass 1.5 to 4 dm. high, with flat leaves and few-flowered, nodding panicles 3 to 12 cm. long.—Labrador, White Mountains, Adirondacks, Rocky Mountains in Colorado, northward to Alaska. [Northern Europe and Asia.] July–September.

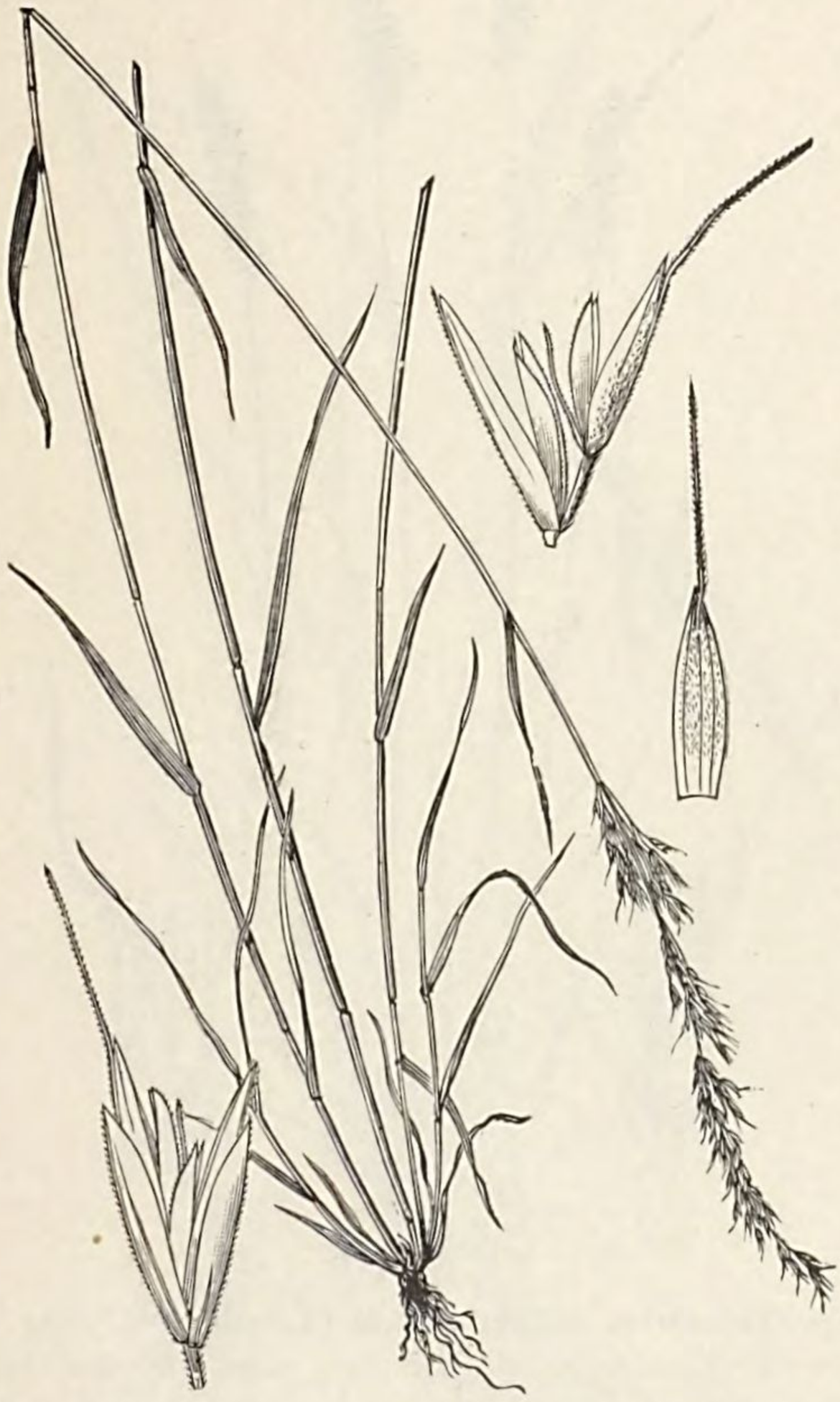

FIG. 159. **Trisetum palustre** (Michx.) Torr. MARSH OAT-GRASS.—A slender, loosely tufted perennial 6 to 9 dm. high, with flat, soft leaves and loosely flowered, nodding, and yellowish green panicles.—On moist rocks, along brooks, in wet meadows, etc., Massachusetts to Illinois, south to Florida and Louisiana; British Columbia. April–June.

FIG. 160. **Trisetum subspicatum** (L.) Beauv. (*Aira subspicata* L.). DOWNY OAT-GRASS.—A slender, erect perennial 1.5 to 4.5 dm. high, with usually downy culms and leaves and densely many-flowered, spike-like panicles.—Widely distributed in the cooler temperate regions of both hemispheres, ranging in North America from Labrador to Alaska and extending southward in the Eastern States to the mountains of North Carolina and Tennessee, and in the West to New Mexico and California. June-September.

FIG. 161. **Trisetum montanum** Vasey; Beal, Grasses N. Am., **2**: 379. ROCKY MOUNTAIN OAT-GRASS.—A slender, erect, or ascending native grass 3 to 8 dm. high, with narrow, flat leaves and many-flowered, more or less contracted panicles 8 to 12 cm. long.—Mountains of Colorado and New Mexico. July, August.

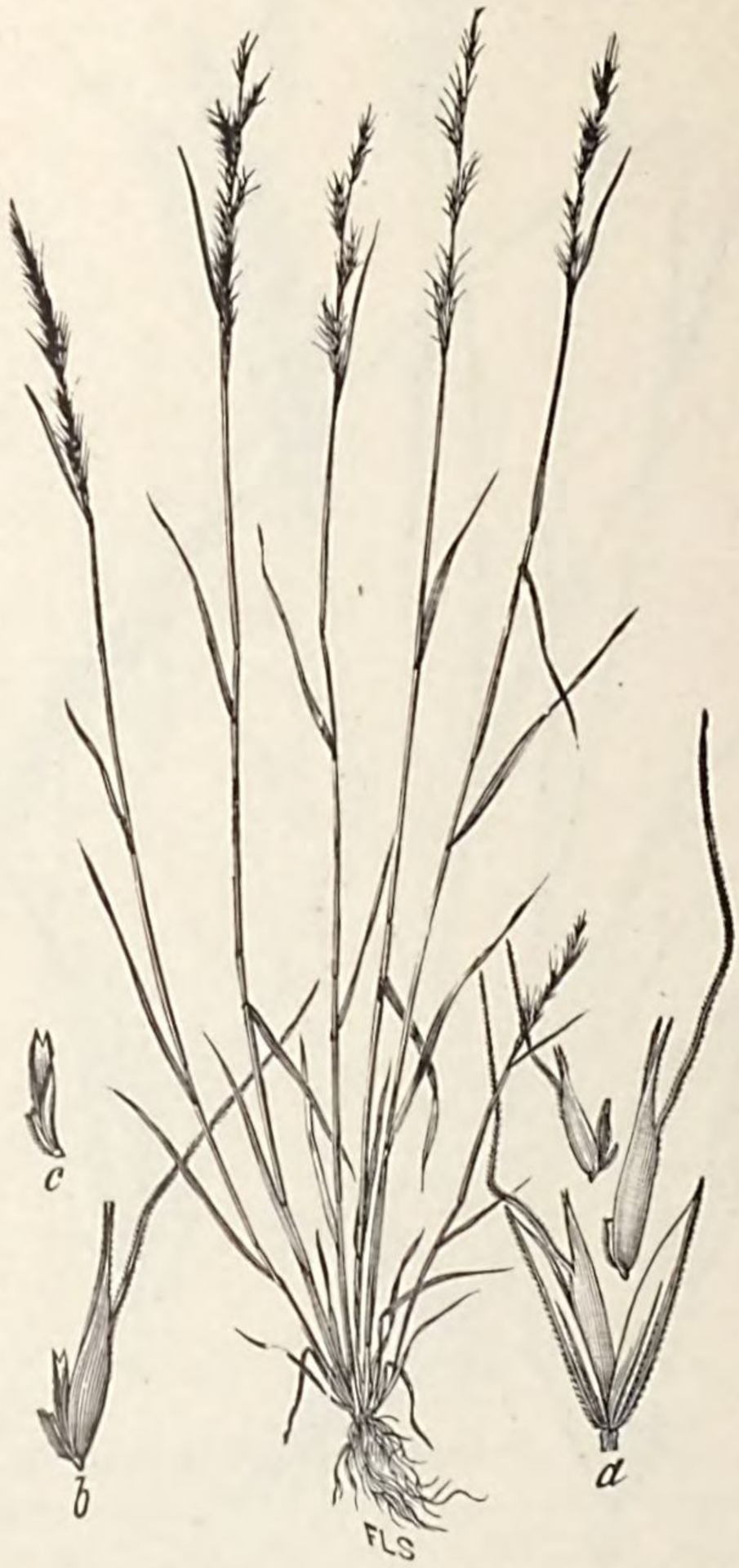

FIG. 162. **Trisetum interruptum** Buckl.; Beal, Grasses N. Am., 2: 376, under *T. elongatum*. SLENDER OAT-GRASS.—A slender, erect annual 2 to 5 dm. high, with rather short, soft leaves and narrow, elongated panicles 4 to 10 cm. long.—Colorado to Texas, Arizona, and southern California. March–May.

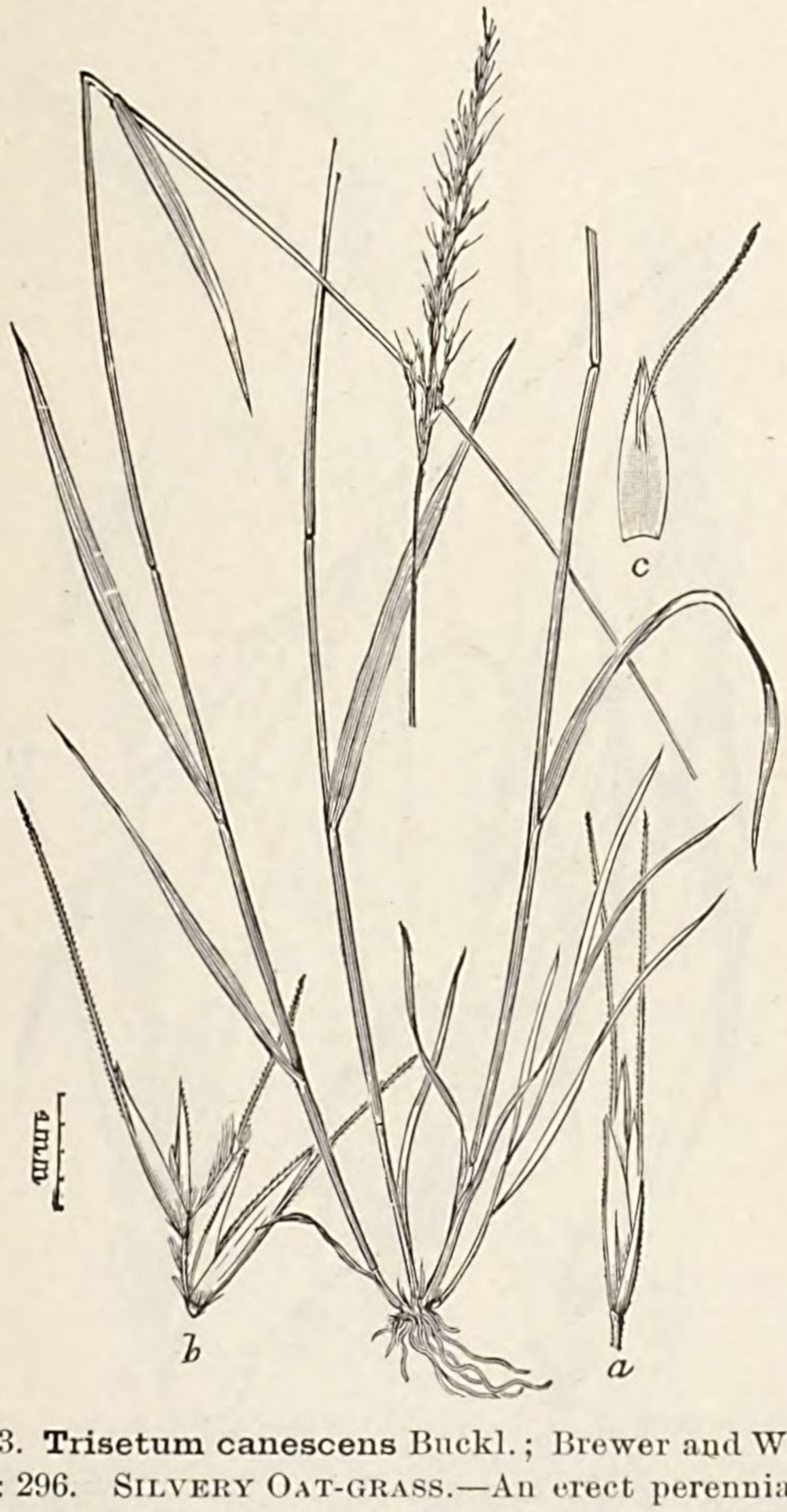

FIG. 163. **Trisetum canescens** Buckl.; Brewer and Wats., Bot. Calif., **2**: 296. SILVERY OAT-GRASS.—An erect perennial 3 to 12 dm. high, with flat leaves, and more or less densely flowered panicles 12 to 18 cm. long.—In dry, open ground, open woods, thickets, and wet meadows, California to British Columbia, east to Montana. May–September.

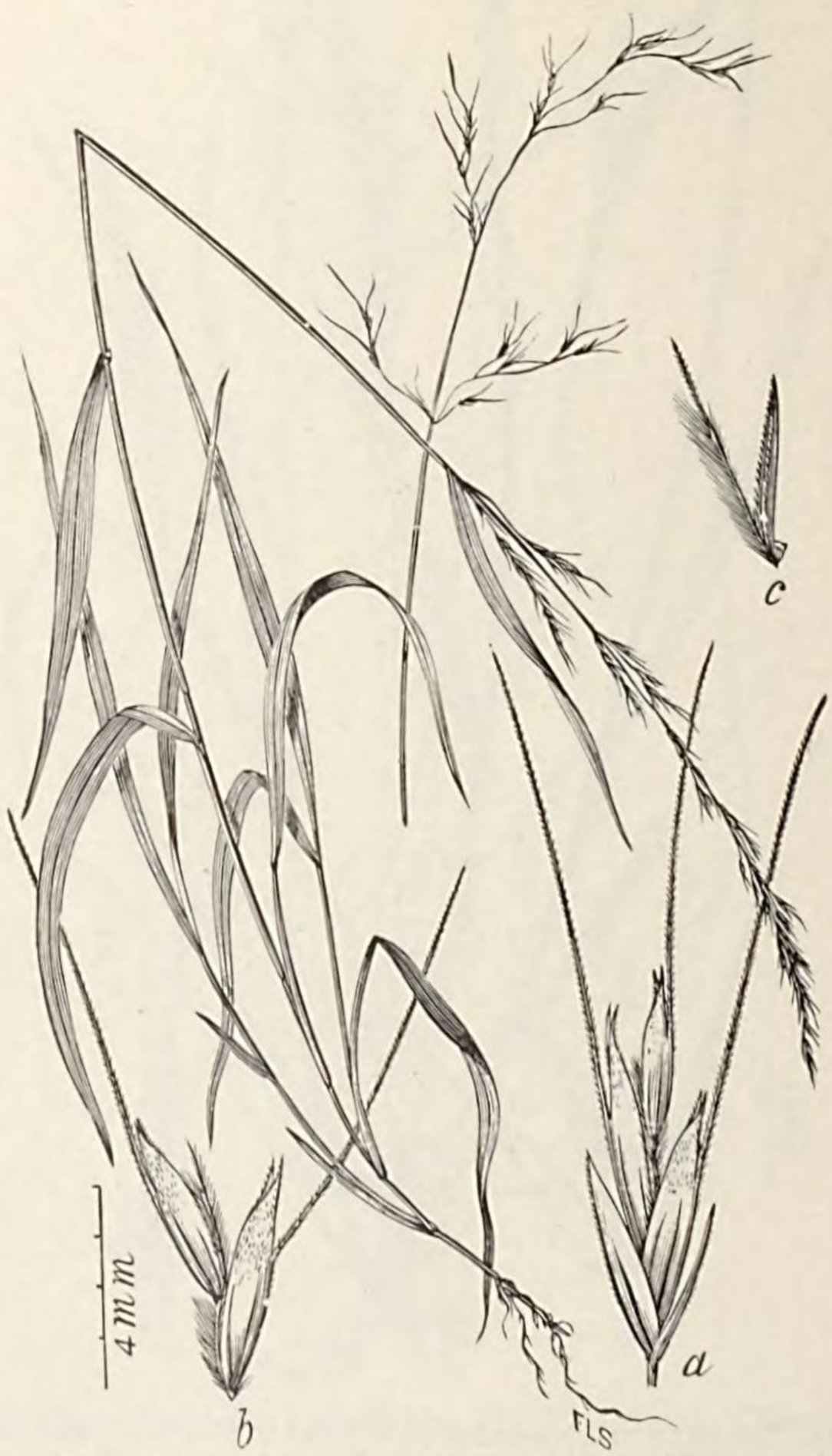

FIG. 164. **Trisetum cernuum** Trin.; Beal, Grasses N. Am., **2**: 379. NODDING OAT-GRASS.—A slender perennial 6 to 10 dm. high, with rather broad, flat leaves and loosely flowered, nodding panicles 12 to 20 cm. long.—Alaska to northern California and eastward to Idaho. May–July.

FIG. 165. **Avena americana** (Scribn.) (*A. pratensis* var. *americana* Scribn.; *A. hookeri* Scribn.). AMERICAN OAT.—A rigidly erect perennial 3 to 6 dm. high, with narrow, firm leaves, and contracted panicles 8 to 12 cm. long.—Open thickets and prairies, Manitoba, and in the foothills of the Rocky Mountains southward to Colorado. June–August.

FIG. 166. **Avena mortoniana** Scribn.; Bot. Gaz., **21**: 133. MORTON'S OAT-GRASS.—A densely cæspitose, erect perennial 1 to 2.5 dm. high, with rather rigid leaves and narrow, simple panicles of one- to two-flowered spikelets.—At 3,900 to 4,200 m. altitude, mountains of Colorado. August.

FIG. 167. **Arrhenatherum elatius** (L.) Beauv. (*Avena elatior* L.). TALL OAT-GRASS.—A loosely tufted perennial 6 to 12 dm. high, with flat leaves and narrow, loosely flowered panicles 15 to 20 cm. long.—Introduced from Europe as a fodder grass. Valuable; in Europe regarded as one of the best meadow grasses. May, June.

FIG. 168. **Danthonia spicata** (L.) Beauv. (*Avena spicata* L.). WILD OAT-GRASS.—A smooth, slender, erect perennial 2.5 to 5 dm. high, with a few-flowered, narrow panicle spreading only in flower.—Common in dry, thin soils from Canada southward to the Gulf States and westward to Texas. May–September.

FIG. 169. **Danthonia compressa** Austin. TENNESSEE OAT-GRASS.—A slender, erect, tufted perennial 2 to 6 dm. high, with long, narrow root leaves, and few-flowered open panicles.—Mountain regions of eastern Tennessee and North Carolina northward to Canada. June–August.

FIG. 170. **Danthonia sericea** Nutt. SILKY OAT-GRASS.—A rather stout, erect perennial 3 to 9 dm. high, with usually pubescent sheaths, rather rigid leaves, large spikelets, and terminal, few-flowered panicles.—Open woodlands in dry soil, Massachusetts and New Jersey to Florida and west to Tennessee and Alabama. May, June.

FIG. 171. **Capriola dactylon** (L.) Kuntze (*Panicum dactylon* L.; *Cynodon dactylon* Pers.). BERMUDA-GRASS.—A creeping perennial, with upright or ascending, leafy flowering branches 1 to 6 dm. high.—Widely dispersed over the tropical and warmer temperate regions of the world, in the United States from Pennsylvania southward to Florida and westward to Texas and California. April–October. (The name *Capriola* may belong to *Panicum sanguinale*.)

FIG. 172. **Spartina polystachya** (Michx.) Ell. (*Trachynotia polystachya*). SALT REED-GRASS.—A stout, erect perennial 12 to 27 dm. high, with long, flat leaves and terminal panicles of twenty to fifty crowded, ascending spikes 5 to 10 cm. long.—Brackish marshes along the coast, Maine to Mississippi. July–October.

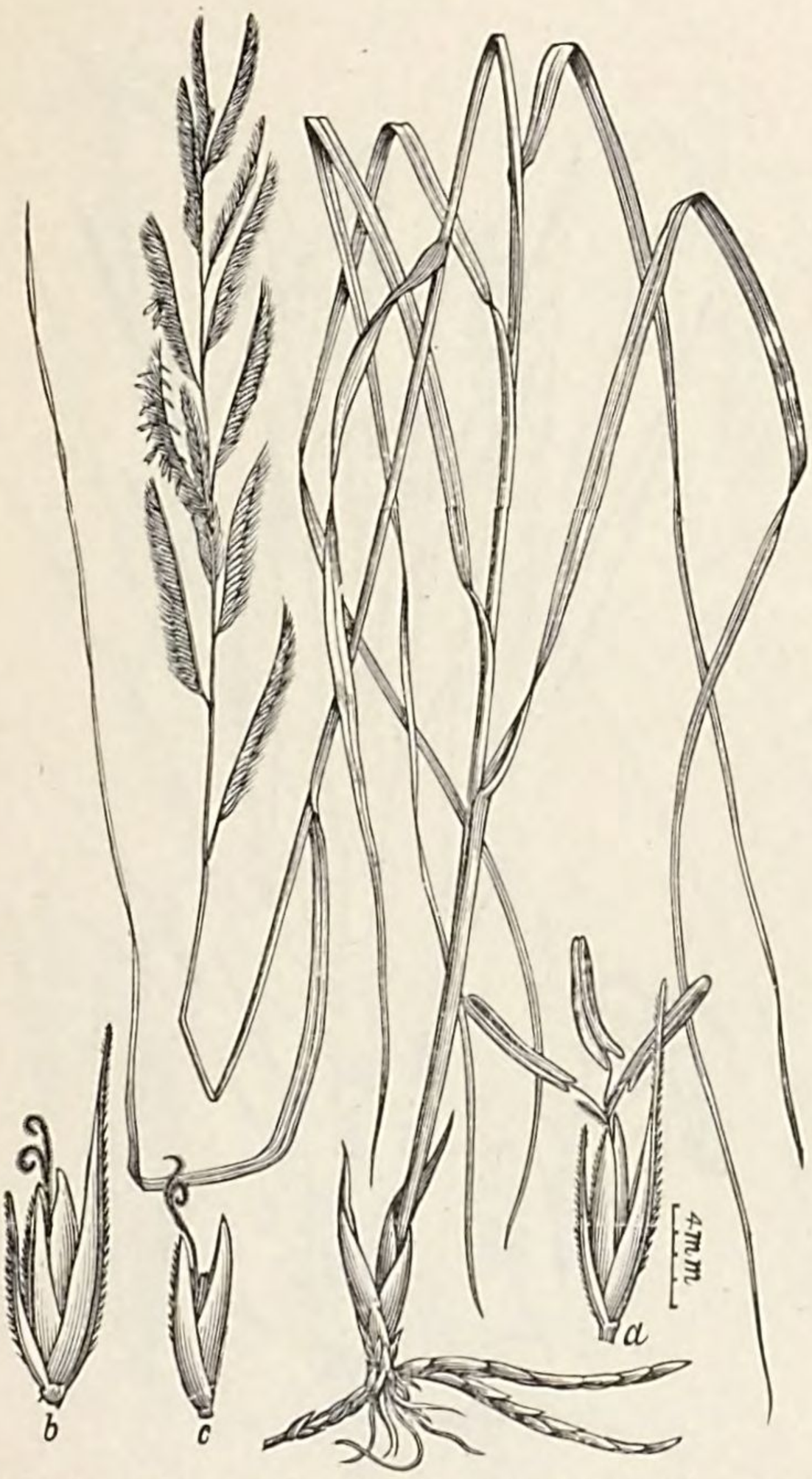

FIG. 173. **Spartina cynosuroides** (L.) Willd. FRESHWATER CORD-GRASS.—A stout, erect grass 6 to 18 dm. high, with unbranched, smooth culms from strong, scaly, creeping rootstocks, long, tough leaf blades, and five to twenty spikes, forming a terminal panicle.—River banks and lake shores, also brackish coast marshes, Maine and Nova Scotia to Assiniboia and Oregon, south to New Jersey, western Tennessee, Texas, and Colorado. July–October.

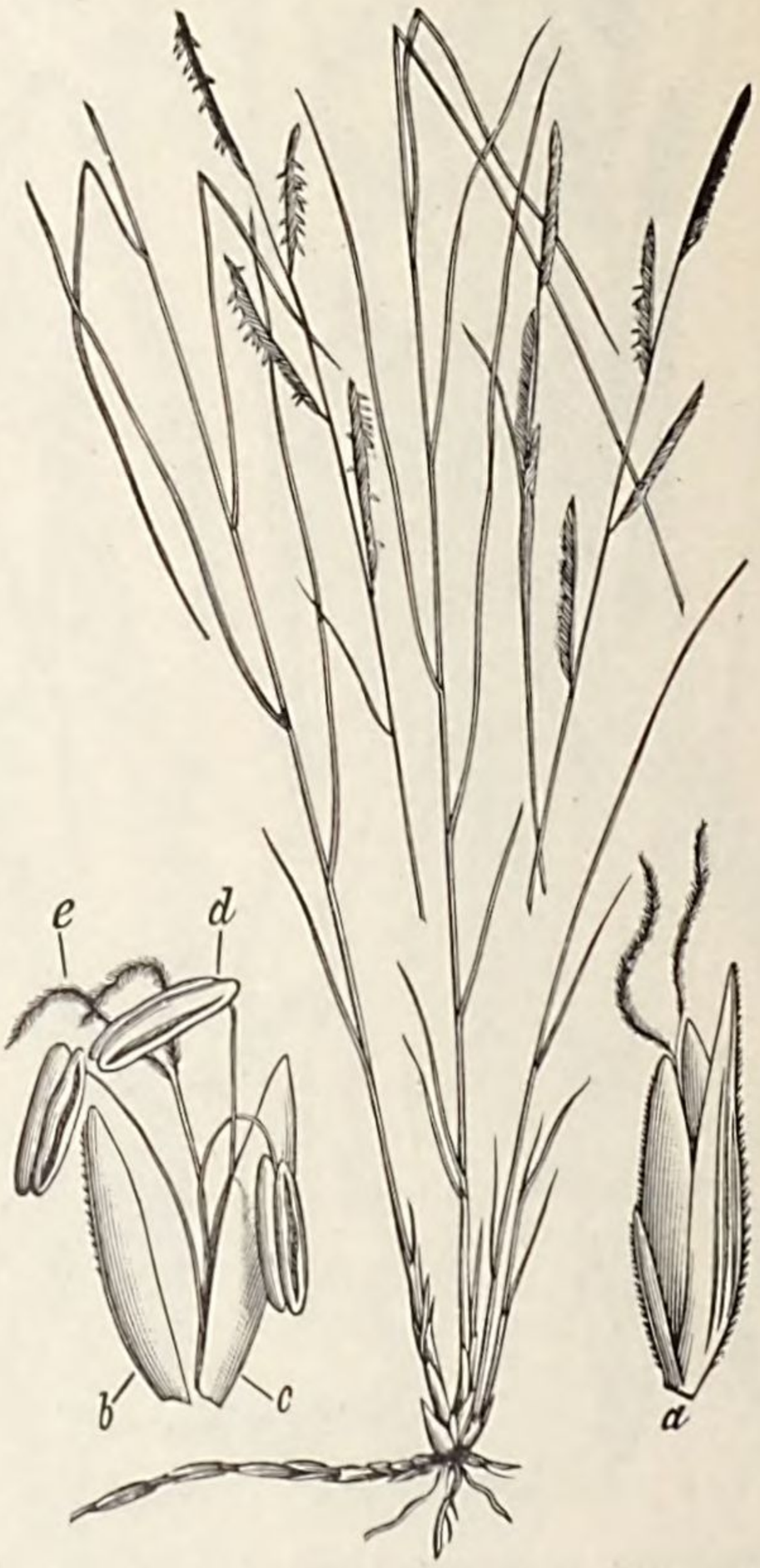

FIG. 174. **Spartina patens** (Ait.) Muhl. (*Dactylis patens* Ait.; *Spartina juncea* Ell.). FOX-GRASS.—A rather slender and somewhat wiry grass 3 to 6 (rarely 9) dm. high, with two to four slender, erect or widely spreading spikes.—Salt marshes and sandy shores along the coast from Newfoundland to Florida and westward to Texas. June–September.

FIG. 175. **Spartina gracilis** Trin. WESTERN CORD-GRASS.—A comparatively slender, perennial species 3 to 9 dm. high, with flat leaves, and three to nine rather short, appressed spikes.—Meadows, swamps, and river bottoms, especially in alkaline soils, South Dakota to Kansas, west to British Columbia, Nevada, and California. March–August.

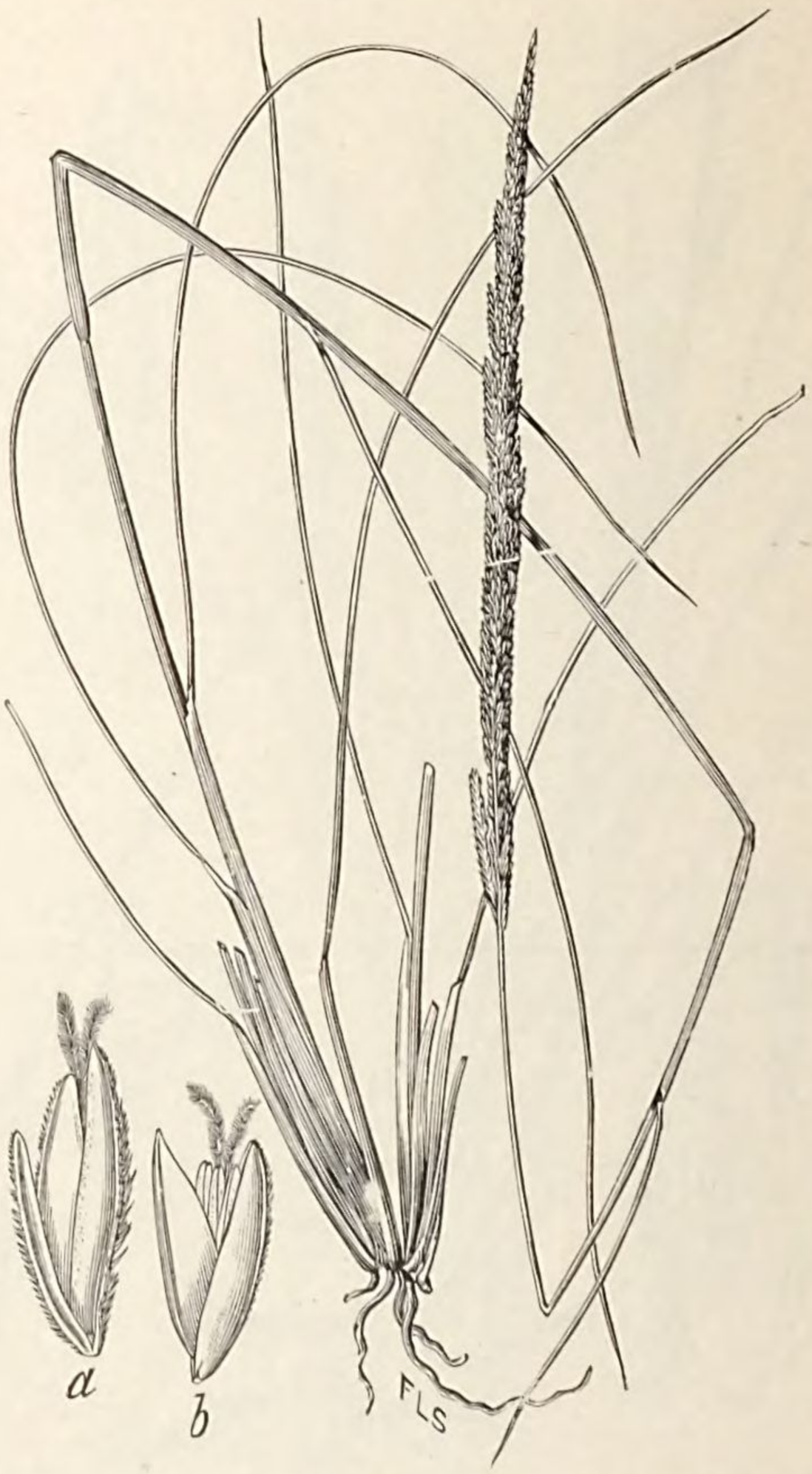

FIG. 176. **Spartina junciformis** Engelm. & Gray (*S. densiflora* Brongn. (?); *S. gouini* Fourn.); Beal, Grasses N. Am., **2**: 400. RUSH-LIKE SPARTINA.—A stout perennial 6 to 15 dm. high, with very long, narrow leaves and short, appressed spikes, which form a cylindrical, spike-like inflorescence 10 to 30 cm. long.—Brackish marshes along the Gulf Coast, Key West, Florida to Texas. [Mexico and Chile.?] June–October.

FIG. 177. **Spartina stricta maritima** (Walt.) Scribn. (*Dactylis maritima* Walt.; *Spartina glabra* Muhl.). CREEK SEDGE or THATCH.—An erect and often stout salt-marsh grass from 6 to 24 dm. high, with long, flat leaves and few to many, erect, appressed spikes.—Along ditches and creeks of the salt marshes of both the Atlantic and Pacific coasts. July–October.

FIG. 178. **Campulosus aromaticus** (Walt.) Trin. (*Ægilops aromatica* Walt.; *Ctenium americanum* Spreng.). TOOTHACHE-GRASS.—An erect perennial 9 to 12 dm. high, from strong, lemon-scented and pungent rootstocks, with narrow leaves and usually a single, terminal, curved, pectinate spike 4 to 10 cm. long.—Southern Virginia to Florida and westward to Mississippi. July, August.

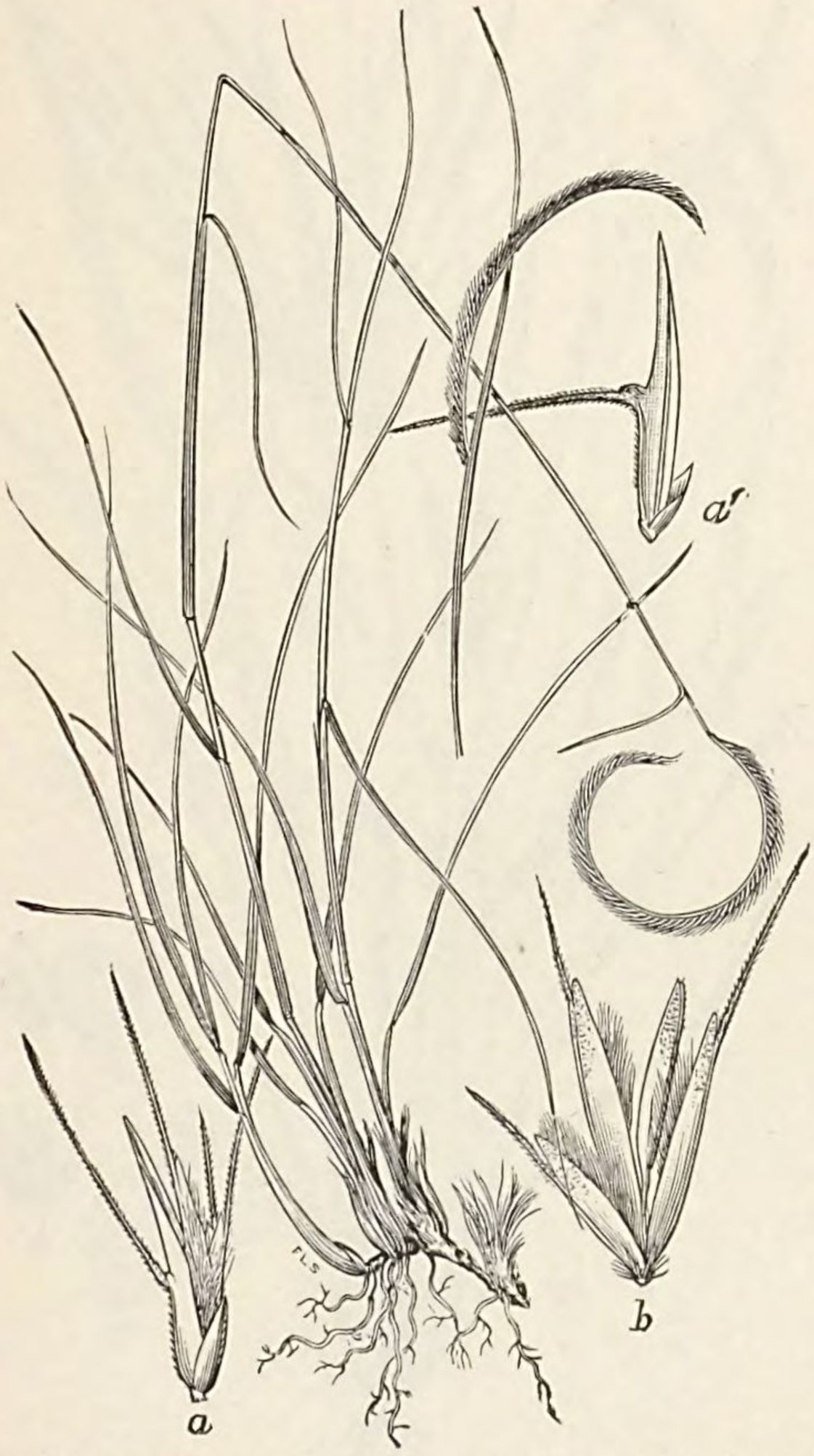

FIG. 179. **Campulosus chapadensis** Trin. (*Ctenium chapadense* Doell).—An erect perennial 8 to 12 dm. high, with narrow leaves and usually single, terminal, more or less curved spikes. More slender than *C. aromaticus*, with narrower glumes, and more delicate and longer awns.—Florida, in the "flat woods" regions. July–October.

FIG. 180. **Chloris glauca** (Chapm.) Vasey (*Eustachys glauca* Chapm.); Beal, Grasses N. Am., **2**: 408. SMOOTH CHLORIS.—A strong-growing perennial, with diffusely spreading and ascending culms 6 to 12 dm. long, bearing 10 to 25 slender terminal spikes. Culms and sheaths strongly flattened.—Brackish marshes and along the borders of cypress swamps, Florida. July–September.

FIG. 181. **Chloris neglecta** Nash in Bull. Torr. Bot. Club., **22**: 423.—A rather stout perennial 6 to 12 dm. high, with compressed, glabrous culms and sheaths, flat leaves 10 to 35 cm. long, and four to six terminal spikes 8 to 12 cm. long. Closely allied to and much resembling *C. floridana*.—Low pine lands, Florida. October.

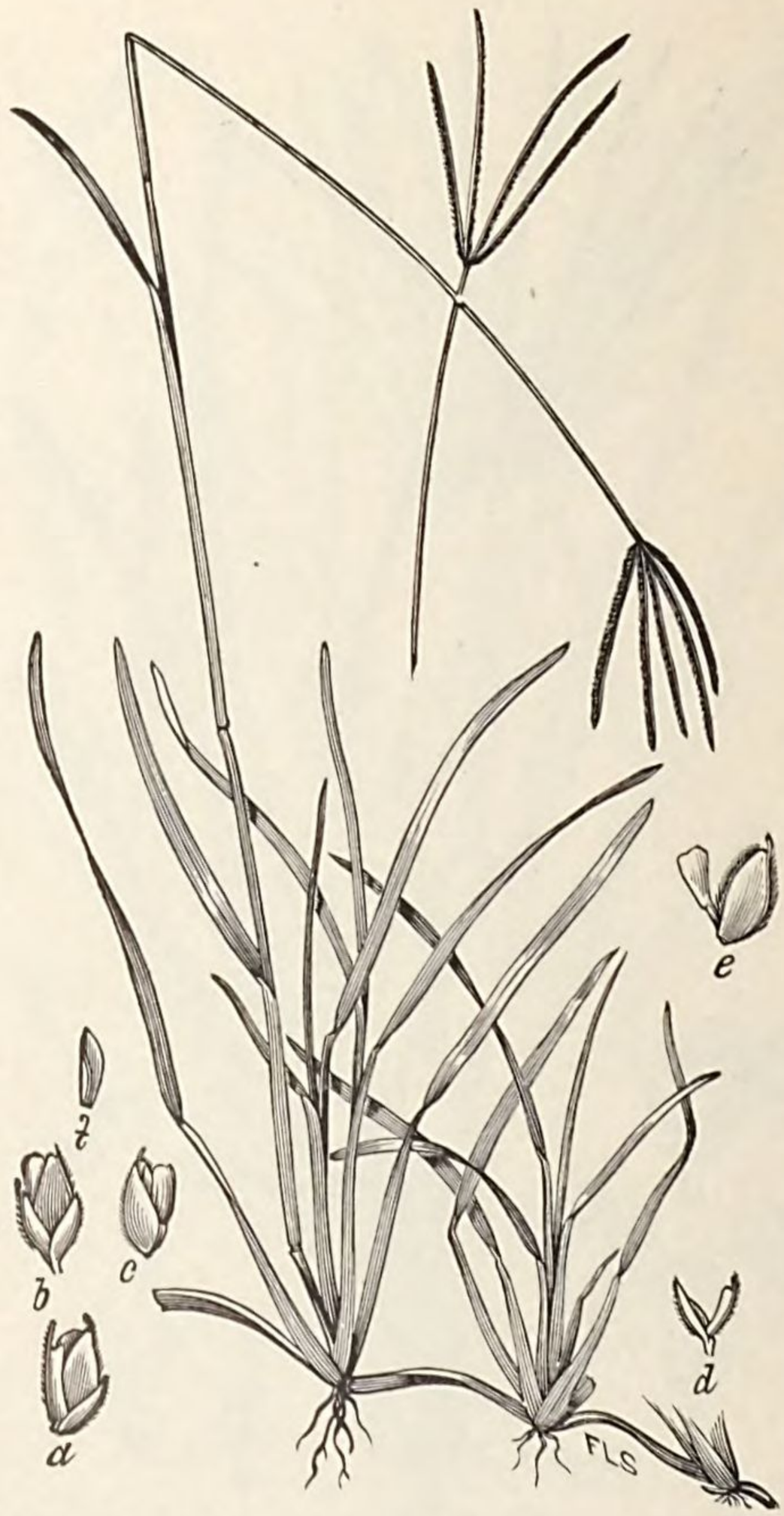

FIG. 182. **Chloris petræa** Sw.; Beal, Grasses N. Am., **2** : 408 (sub. *C. swartziana* Doell). SEASIDE FINGER-GRASS.—A creeping, glaucous perennial 3 to 6 dm. high, with obtuse, flat leaves and three to eight slender spikes 4 to 7 cm. long.—Southern Florida to southeastern Texas. [West Indies and Central and South America.] March–October.

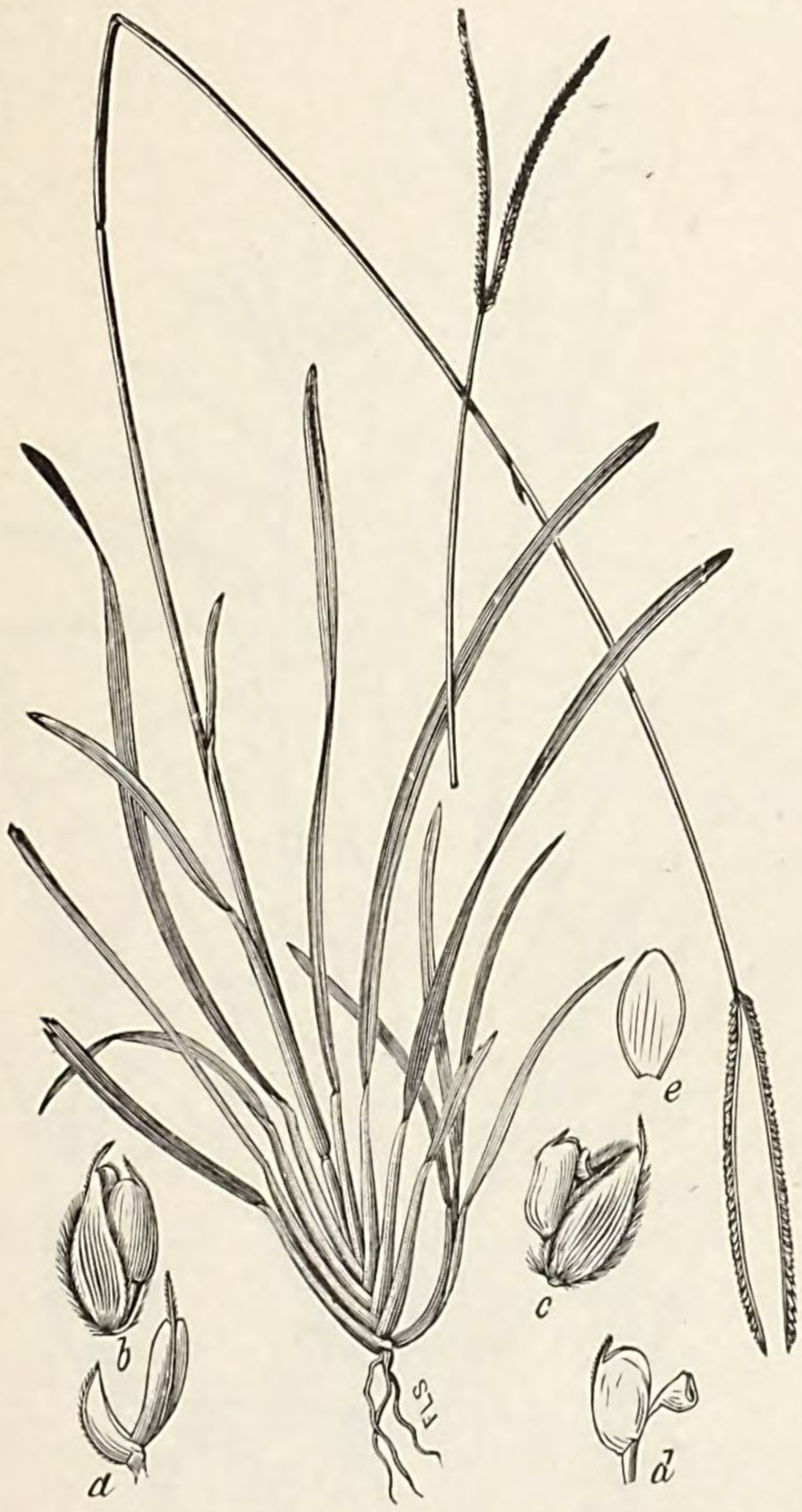

FIG. 183. **Chloris floridana** (Chapm.) Vasey (*Eustachys floridana* Chapm.); Beal, Grasses N. Am., **2** : 407.—A smooth, rather slender perennial 3 to 6 dm. high, with compressed culms and sheaths, flat leaves and one or two spikes 6 to 8 cm. long. The spikes in this and in *C. neglecta* are stouter than in *C. petræa*.—Dry, sandy soil, Florida. July–October.

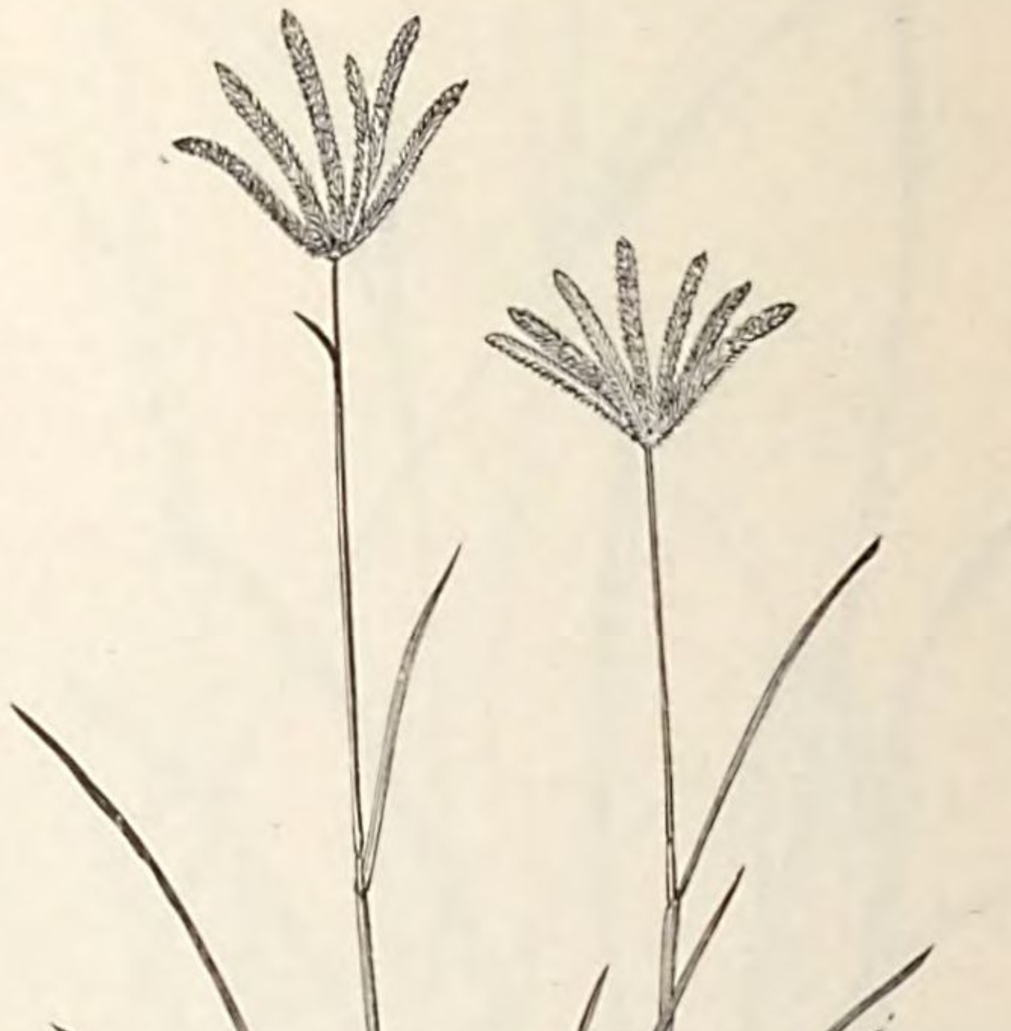

FIG. 184. **Chloris cucullata** Bisch.; Beal, Grasses N. Am., **2**: 407.—A rather slender, cæspitose perennial 2 to 4 dm. high, with narrow, flat leaves and eight to twelve spikes digitate or umbellate at the apex of the culms. Uppermost glumes cucullate.—Sandy plains, Texas to Arkansas. March–September.

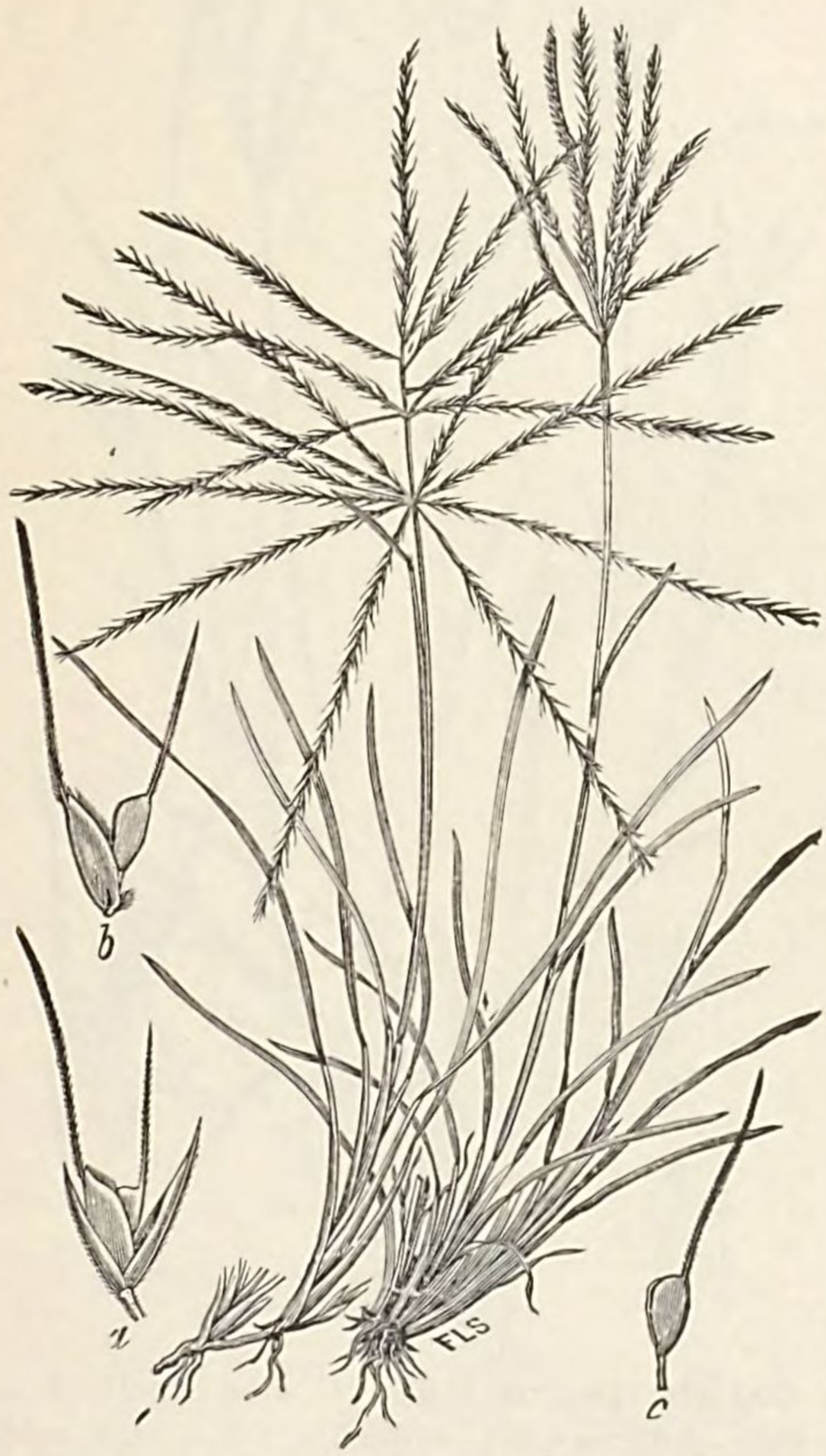

FIG. 185. **Chloris verticillata** Nutt. WINDMILL-GRASS.—A low, spreading perennial, with rather stout, upright flowering branches 1.5 to 5 dm. high and numerous widely spreading, slender spikes 8 to 13 cm. long.—Prairies, Kansas to Texas. A good turf former. May–September.

FIG. 186. **Chloris elegans** HBK. (*C. alba* Presl); Beal, Grasses N. Am., **2**: 403.—An erect perennial 3 to 6 dm. high, with slightly inflated sheaths, flat leaves and eight to twelve silky-bearded spikes, clustered or umbellate at the apex of the culms.—Dry mesas and desert hills of western Texas, southern Arizona, New Mexico, southern California and southward. An ornamental grass. June–November.

FIG. 187. **Chloris polydactyla** (L.) Sw. (*Andropogon polydactylon* L.). MANY-SPIKED CHLORIS.—A rather stout, leafy perennial about 6 dm. high, with numerous, more or less flexuose, brownish spikes 8 to 13 cm. long.—Florida. [West Indies and South America.]

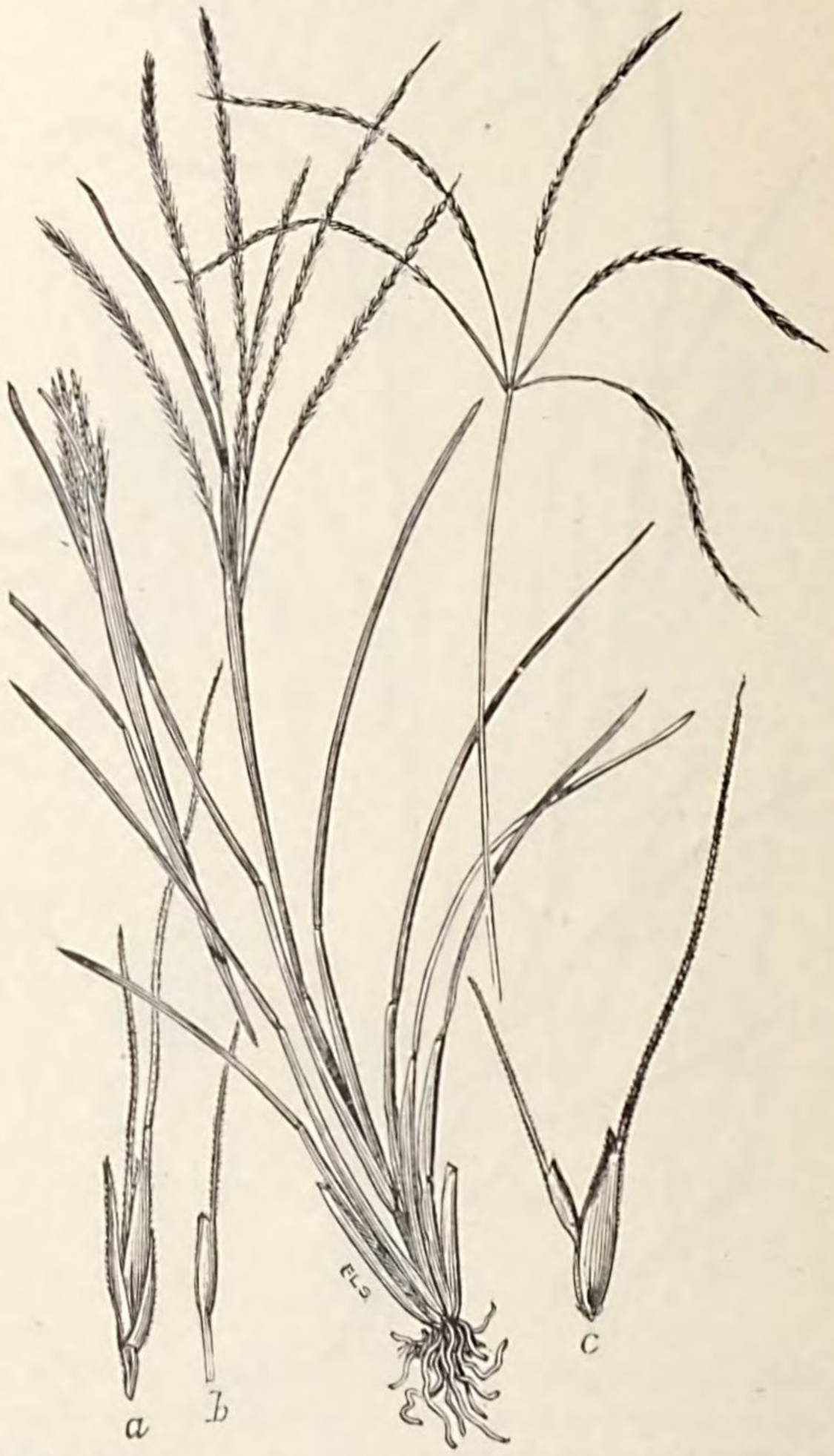

FIG. 188. **Chloris texensis** Nash in Bull. Torr. Bot. Club, **23**: 151.—A smooth, glaucous perennial 3 to 6 dm. high, the crowded lower sheaths compressed, with flat leaves and five to eight slender, terminal, digitate spikes 10 to 18 cm. long.—Texas. [Mexico?.]

FIG. 189. **Trichloris blanchardiana** Scribn. (*T. fasciculata* Fourn.).—A rather stout perennial 5 to 10 dm. high, with long, narrow leaves and many, slender, bearded spikes, which are fasciculate or subdigitate at the apex of the culm.—Dry plains and mesas, Texas to Arizona. May–September.

FIG. 190. **Trichloris pluriflora** Fourn. MANY-FLOWERED TRICHLORIS.—A glaucous, erect perennial 6 to 12 dm. high, with long, flat leaves and numerous erect, many-flowered, bearded spikes 8 to 15 cm. long. Spikelets three- to four-flowered.—Southern and western Texas. [Mexico.] May–July.

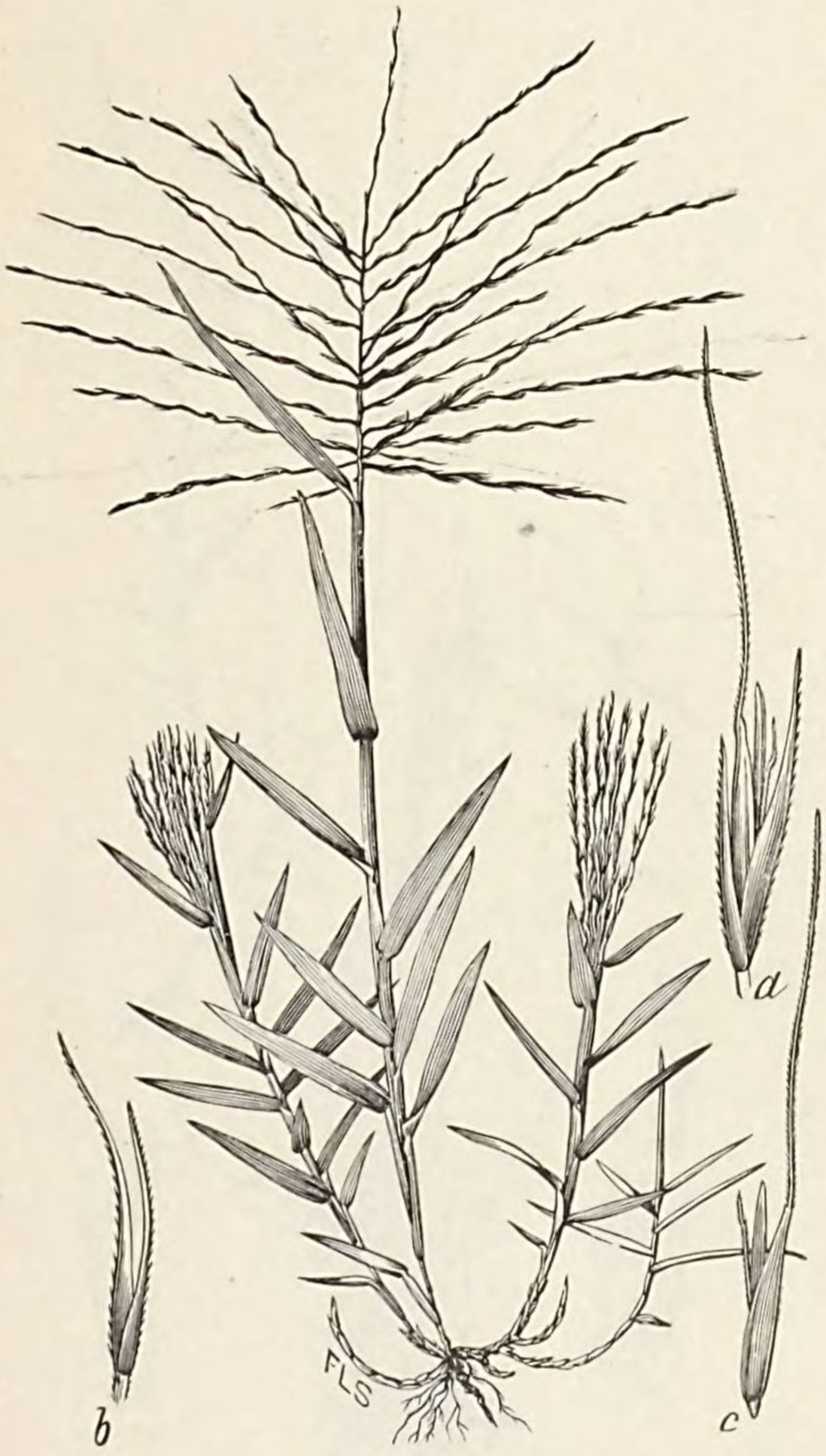

FIG. 191. **Gymnopogon ambiguus** (Michx.) B. S. P.; Britton and Brown, Ill. Fl., **1**: 178 (*G. racemosus* Beauv.). NAKED BEARD-GRASS.—A loosely tufted, erect or ascending perennial 30 to 45 cm. high, with short and broad leaf blades and numerous (fifteen to thirty), slender and widely spreading spikes irregularly scattered along the common rachis.—Dry soil, fields, hillsides, and borders of woods, New Jersey to Missouri, Indian Territory, Texas, and Florida. July–October.

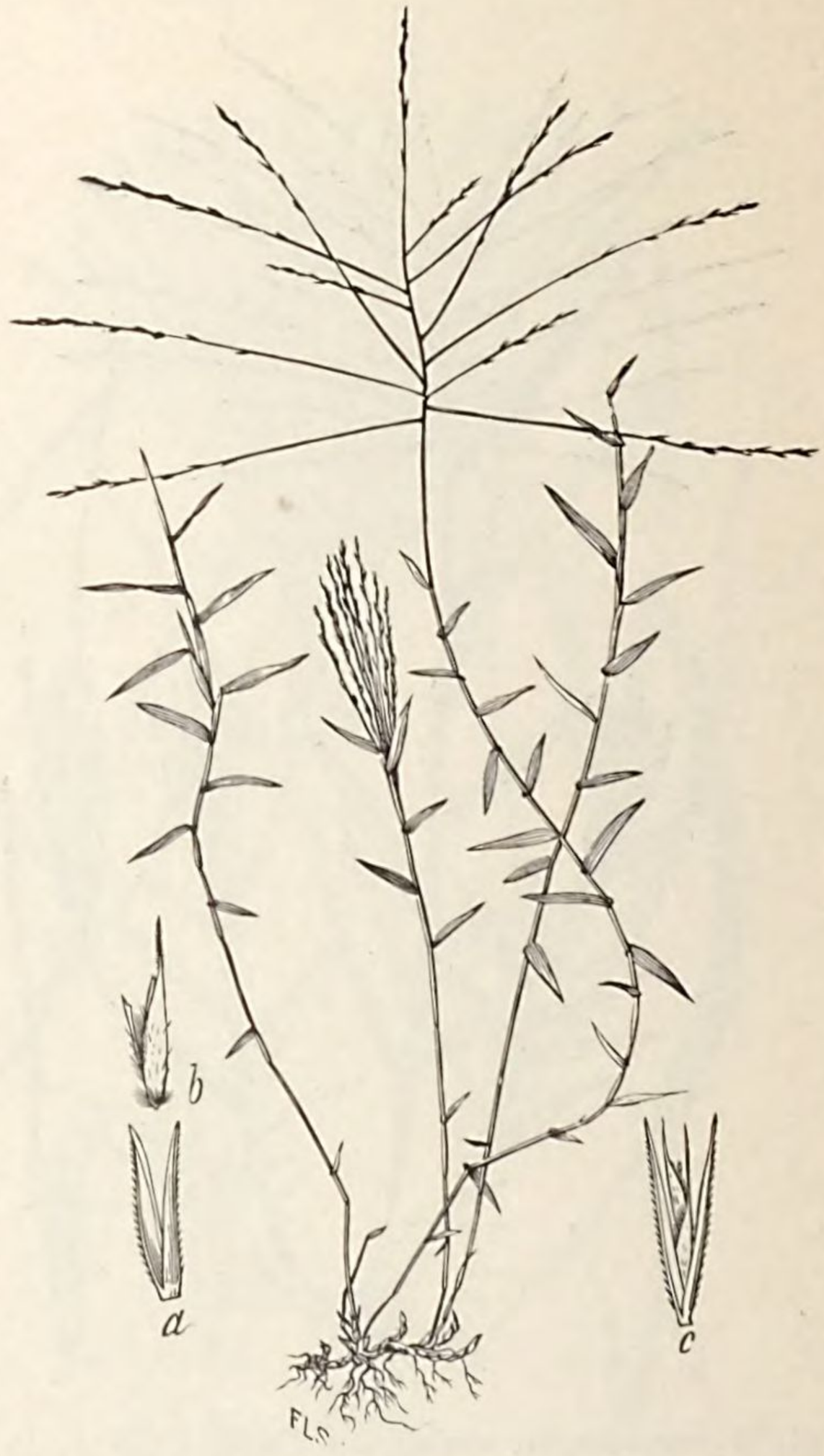

FIG. 192. **Gymnopogon brevifolius** Trin. SHORT-LEAFED BEARD-GRASS.—A slender, loosely tufted and many-jointed perennial, with erect or ascending culms 3 to 6 dm. high, short, flat leaves and numerous very slender spikes, which are naked toward the base.—Dry or moist pine barrens near the coast, New Jersey to Mississippi. August–November.

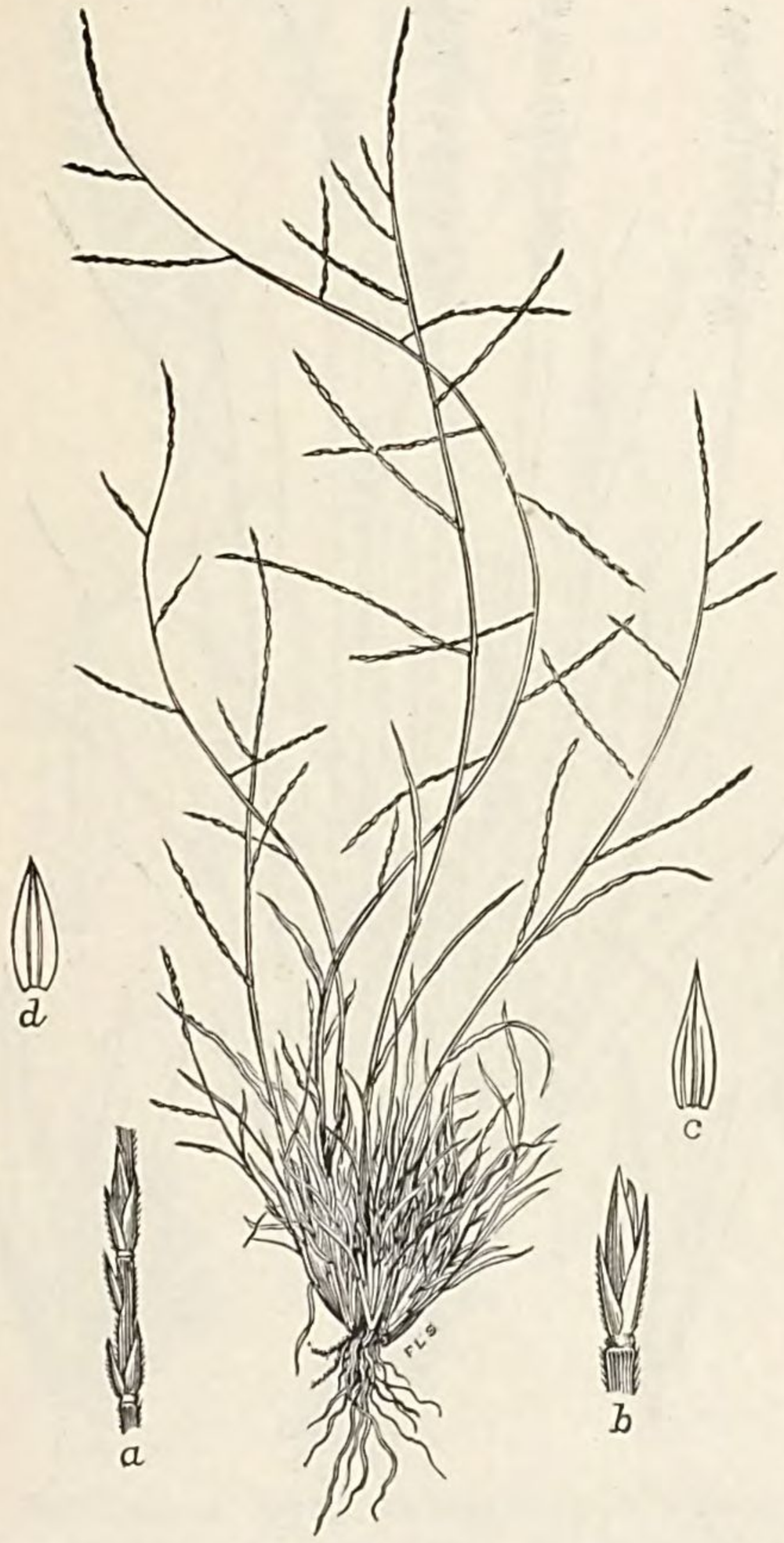

FIG. 193. **Schedonnardus paniculatus** (Nutt.) Trelease; Britton and Brown, Ill. Fl., **1** : 179 (*S. texanus* Steud.). TEXAN CRABGRASS.—A low, diffusely branching annual, with short, narrow leaves and slender, paniculate spikes. The tufted stems vary from 1 to 9 dm. long.—Dry prairies, Illinois to Texas and New Mexico, north to Assiniboia and Manitoba. April–October.

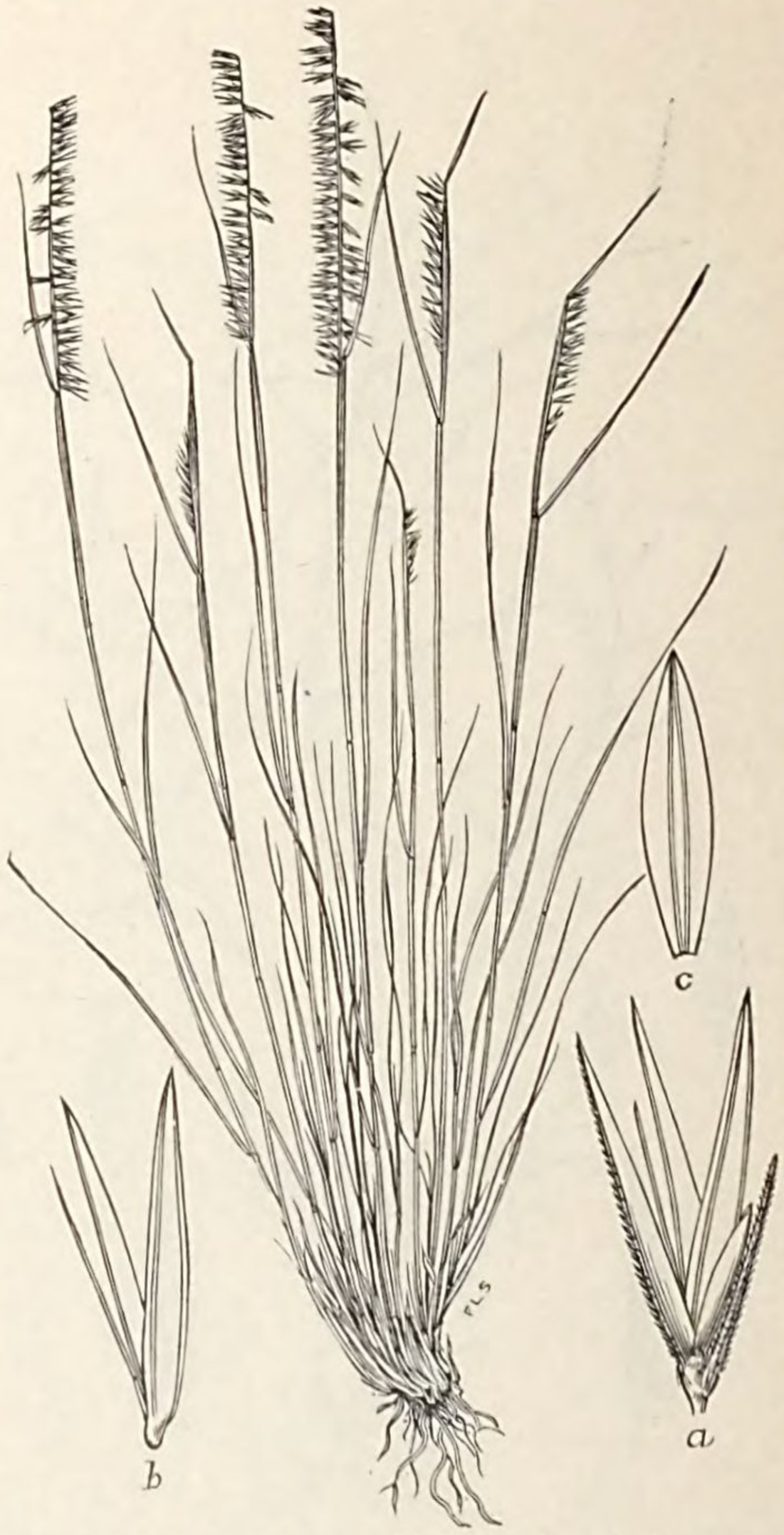

FIG. 194. **Bouteloua uniflora** Vasey; Beal, Grasses N. Am., **2**: 426. ONE-FLOWERED GRAMA.—A slender, erect perennial 3 to 4.5 dm. high, with narrow, long-attenuate-pointed leaves and numerous (twenty-five to seventy-five), spreading or deflexed one-flowered spikes approximate along the common axis.—**Southwestern Texas. September.**

FIG. 195. **Bouteloua curtipendula** (Michx.) Torr. (*B. racemosa* Lag.). TALL GRAMA or SIDE OATS.—A densely tufted perennial 3 to 9 dm. high, with numerous (twenty to sixty), usually spreading or reflexed spikes scattered along the common axis, forming a long, somewhat one-sided raceme 20 to 40 cm. long.—Dry fields, hillsides, and prairies, New York and Ontario to New Jersey, Mississippi, Texas, California, and Manitoba. [Mexico and Central and South America.] May–October.

FIG. 196. **Bouteloua aristidoides** Thurb.; Beal, Grasses N. Am., **2**: 425. SIX-WEEKS MESQUIT.—A slender, densly tufted and much branched annual (?) 1 to 3.5 dm. high, with short, narrow leaves, and three to twelve very narrow and few- (sometimes only one-) flowered spikes.—Texas to southern California. [Mexico and Lower California.] August, September.

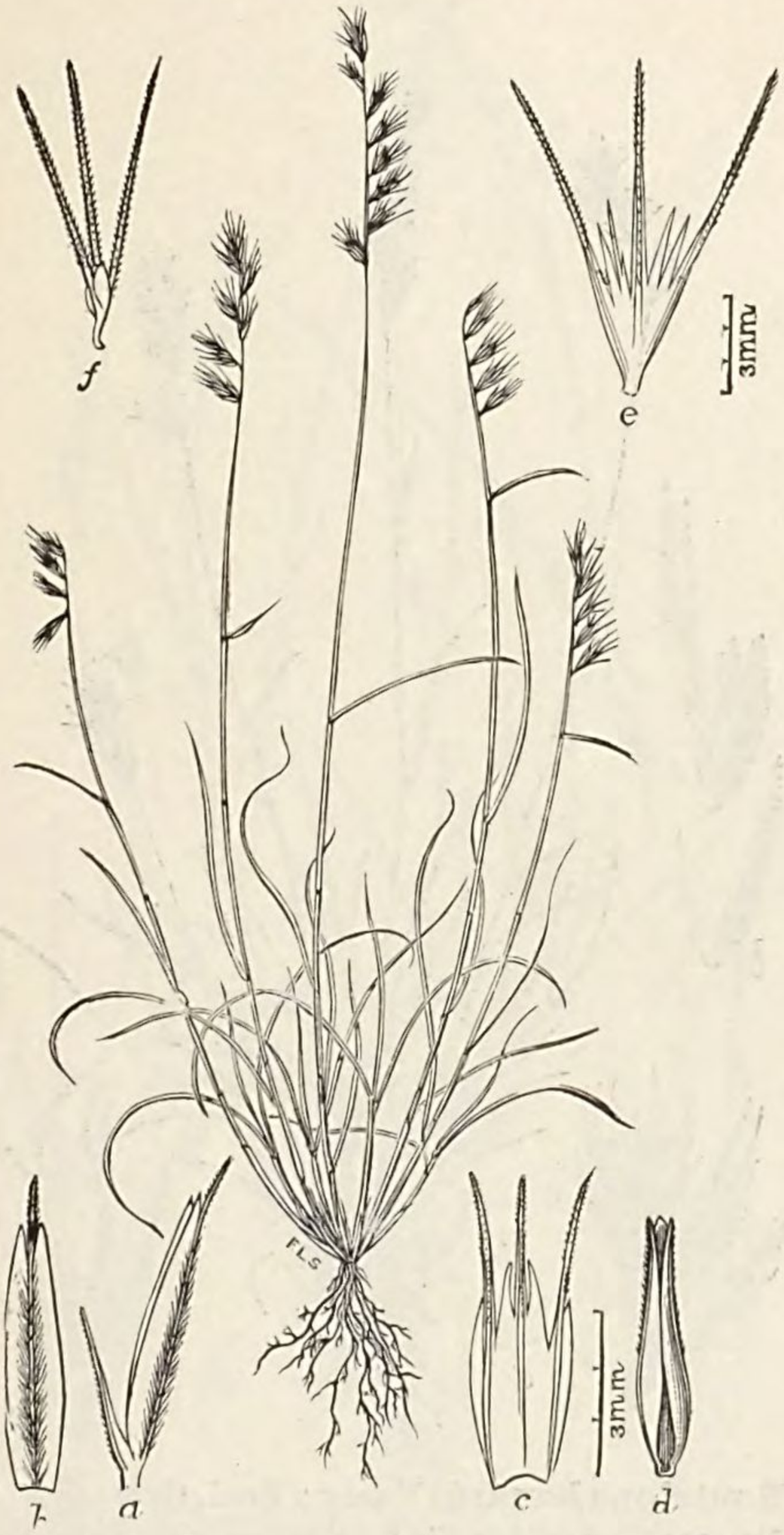

FIG. 197. **Bouteloua texana** S. Wats.; Beal, Grasses N. Am., **2**: 426. SEED MESQUITE.—A densely cæspitose, usually glabrous perennial 2 to 3 dm. high, with narrow, flat leaves, and two to ten short, many-awned spikes, approximate on the common rachis.—Dry soil, Texas and Indian Territory to Arkansas. March, April.

FIG. 198. **Bouteloua havardi** Vasey; Beal, Grasses N. Am. **2**: 424. HAVARD'S GRAMA.—A perennial, with strong rhizomes, upright culms 2 to 4 dm. high, and four to six short, silky-villous spikes approximate on the common rachis.—Sandy plains, rocky hills, canyons, about springs, etc., Texas to Arizona. [Northern Mexico.] April–September.

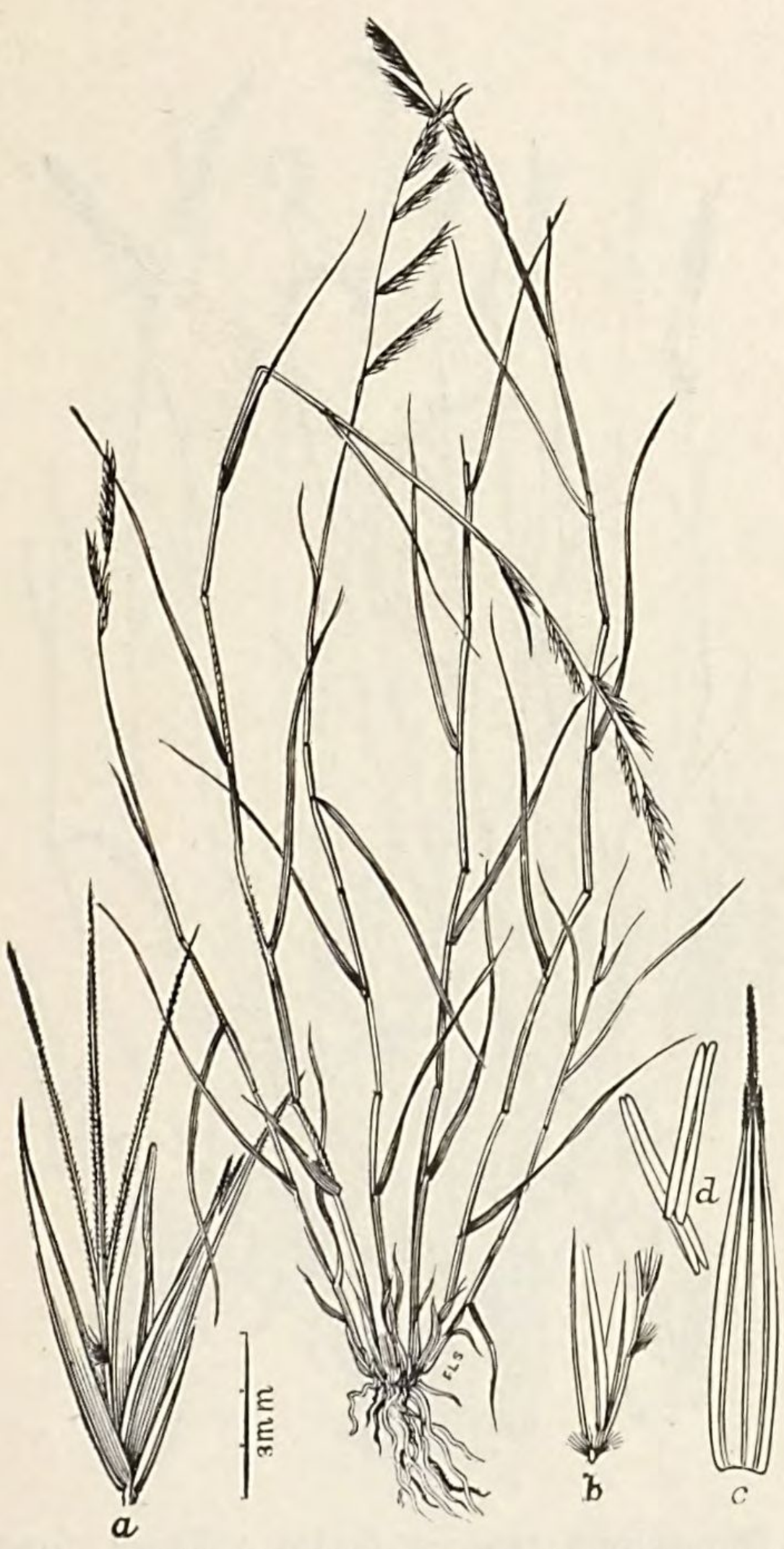

FIG. 199. **Bouteloua eriopoda** Torr.; Beal, Grasses N. Am., **2**: 421. WOOLLY-JOINTED GRAMA.—A slender, branching, and somewhat wiry perennial with wooly-jointed stems 2 to 3.5 dm. long, with three to six slender, spreading, and rather loosely flowered spikes 1.5 to 2.5 cm. long.—Dry, gravelly soil, Texas to Arizona. [Northern Mexico.] August, September.

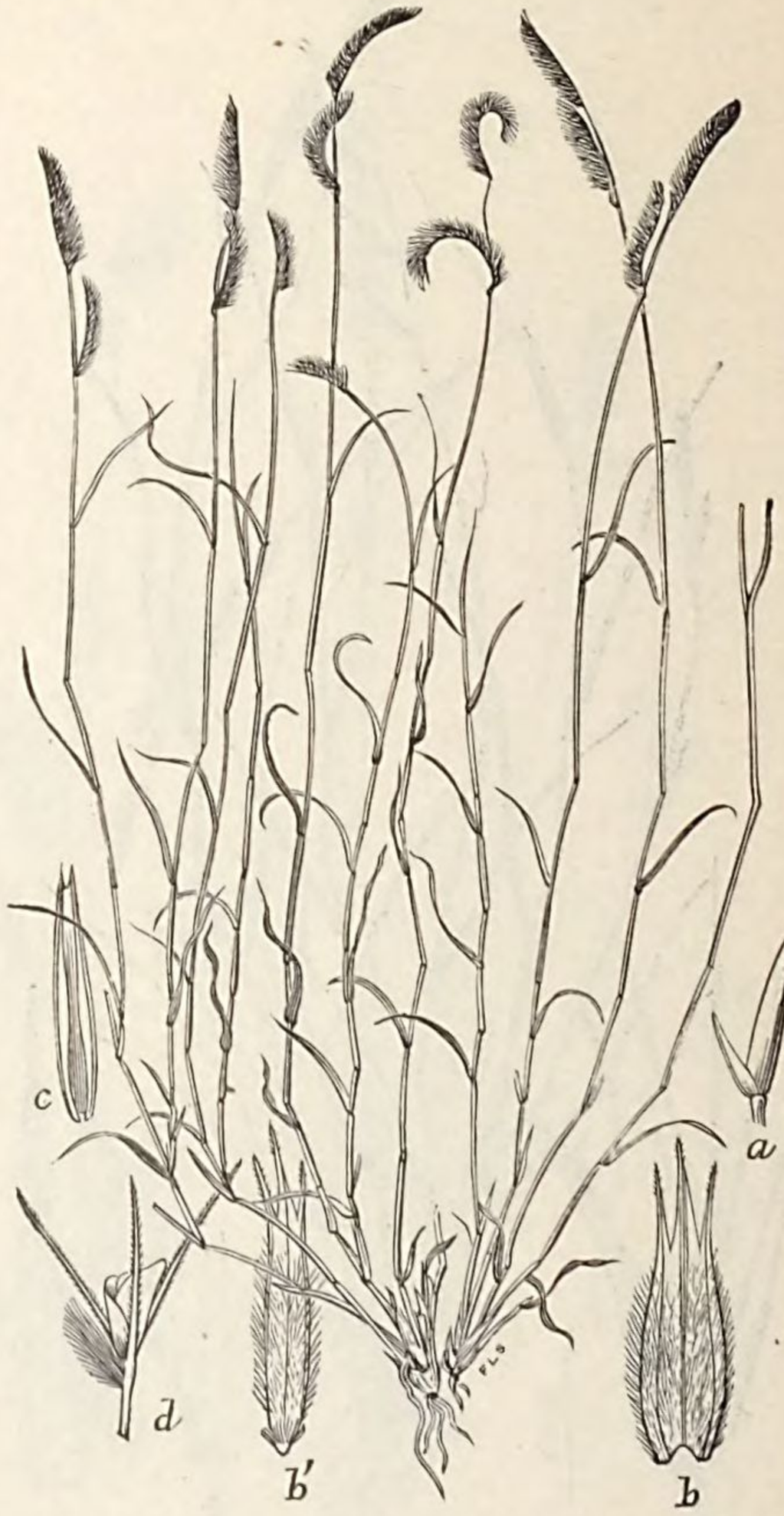

FIG. 200. **Bouteloua ramosa** Scribn.; Vasey, Grasses of the S. W., **1**: 44. WIRY GRAMA.—An erect or ascending perennial, with branching and many-jointed culms 3 to 4.5 dm. high, short, narrow, spreading leaves, and one to three spreading and more or less arcuate spikes 1 to 3 cm. long.—In canyons, mountains of southwestern Texas. [Northern Mexico.] August, September.

FIG. 201. **Bouteloua breviseta** Vasey; Beal, Grasses N. Am., **2**: 420. SHORT-AWNED GRAMA.—An erect, somewhat wiry and densely cæspitose perennial 2.5 to 3.5 dm. high, the lower internodes covered with a thin white bloom. Leaves very narrow, 2 to 4 cm. long. Spikes one to three, erect or somewhat divergent, about 2 cm. long.—Southwestern Texas. September.

FIG. 202. **Bouteloua vestita** (S. Wats.) Scribn.; Beal, Grasses N. Am., **2**: 419. HAIRY GRAMA.—A tufted annual, with erect or ascending slender culms 3 to 6 dm. high, with short, flat leaves and two to eight ascending, many-flowered, hairy spikes about 2 cm. long.—Sandy banks of streams and "benches" on mountain sides, western Texas to southern Arizona. [Mexico.] September, October.

FIG. 203. **Bouteloua rothrockii** Vasey. ROTHROCK'S GRAMA.—A densely cæspitose perennial, with erect, simple or sparingly branched leafy culms 1.5 to 2 dm. high, and five to nine more or less spreading, densely flowered spikes 2 to 3 cm. long.—Sandy plains, mesas and foothills, Arizona. [Mexico.] August, September.

FIG. 204. **Bouteloua oligostachya** (Nutt.) Torr. BLUE GRAMA.—A slender perennial 1.5 to 5 dm. high, with one to five remote, pectinately many-flowered, usually spreading spikes 2.5 to 5 cm. long.—Wisconsin to Montana, north to Manitoba and Alberta, south to Texas, Arizona, and southern California; also at Tampa, Fla. [Mexico.] June–October.

FIG. 205. **Bouteloua hirsuta** (HBK.) Lag. BRISTLY MESQUIT.—A cæspitose perennial 1.5 to 4 dm. high, with erect or ascending culms, flat leaves, and one to three more or less spreading, densely flowered spikes 2 to 4 cm. long.—Dry prairies and sandy plains, Illinois and Wisconsin to South Dakota, Nevada, Arizona, and Texas, and (?) southern Florida. [Mexico and Lower California.] July–September.

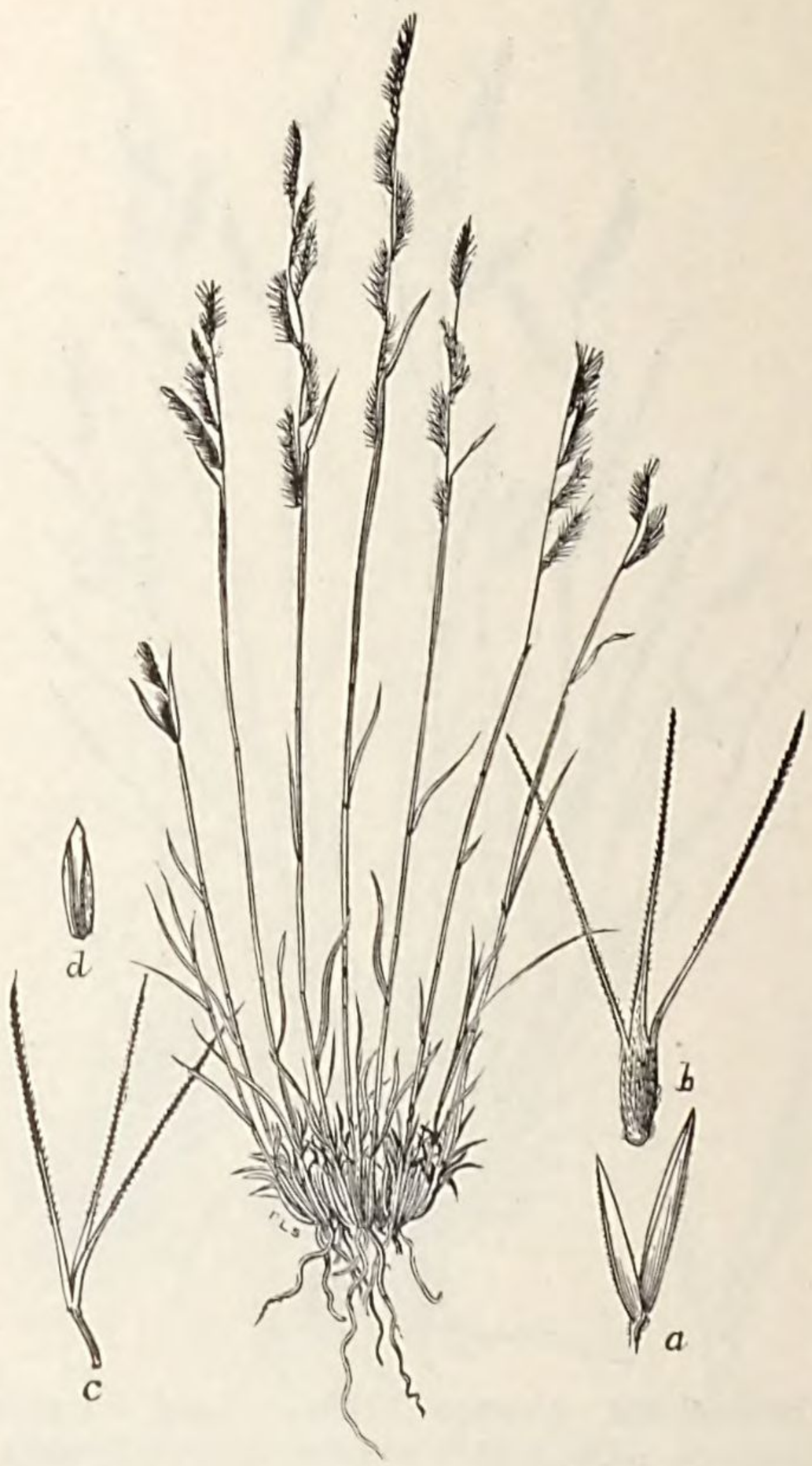

FIG. 206. **Bouteloua trifida** Thurb.; Beal, Grasses N. Am., **2**: 421. SMALL GRAMA.—A delicate perennial 1 to 3 dm. high, with short, narrow leaves, and three to seven ascending spikes usually about 2 cm. long.—Mesas and sandy plains, Texas to Arizona. [Northern Mexico.] May–October.

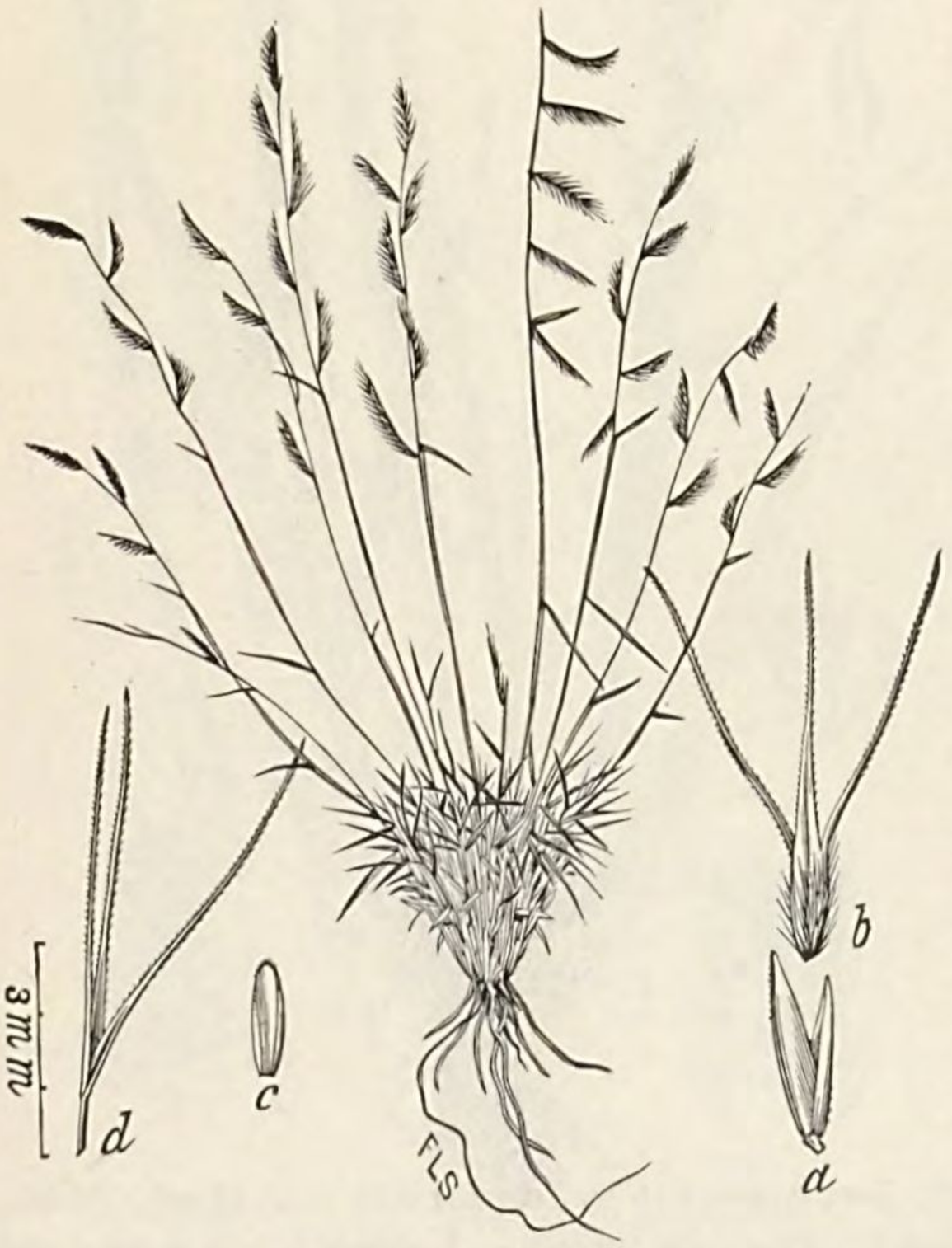

FIG. 207. **Bouteloua burkii** Scribn.; Beal, Grasses N. Am., **2**: 422. BURK'S GRAMA.—A slender, tufted perennial 15 (rarely 30) cm. high, with short, spreading leaves and slender, horizontal spikes 1 to 2 cm. long.—Sandy plains and dry mesas, western Texas. [Northern Mexico.] April–July.

FIG. 208. **Beckmannia erucæformis** (L.) Host (*Phalaris erucæformis* Linn.). SLOUGH-GRASS.—A stout, erect, subaquatic perennial 3 to 12 dm. high, with narrow panicles composed of many, densely flowered one-sided spikes.—In sloughs and along the banks of rivers and streams, western Ontario to Iowa, California, British Columbia, and Alaska. [Europe and Asia.] June-September.

FIG. 209. **Eleusine indica** (L.) Gaertn. GOOSE or YARD-GRASS.—A coarse, tufted annual, with erect or spreading stems 1.5 to 6 dm. high, and two to five digitate spikes 5 to 7 cm. long.—Waste or cultivated ground, New Jersey to Ohio and Kansas, south to Florida and Texas. [Widely distributed in tropical and subtropical countries.] June–October.

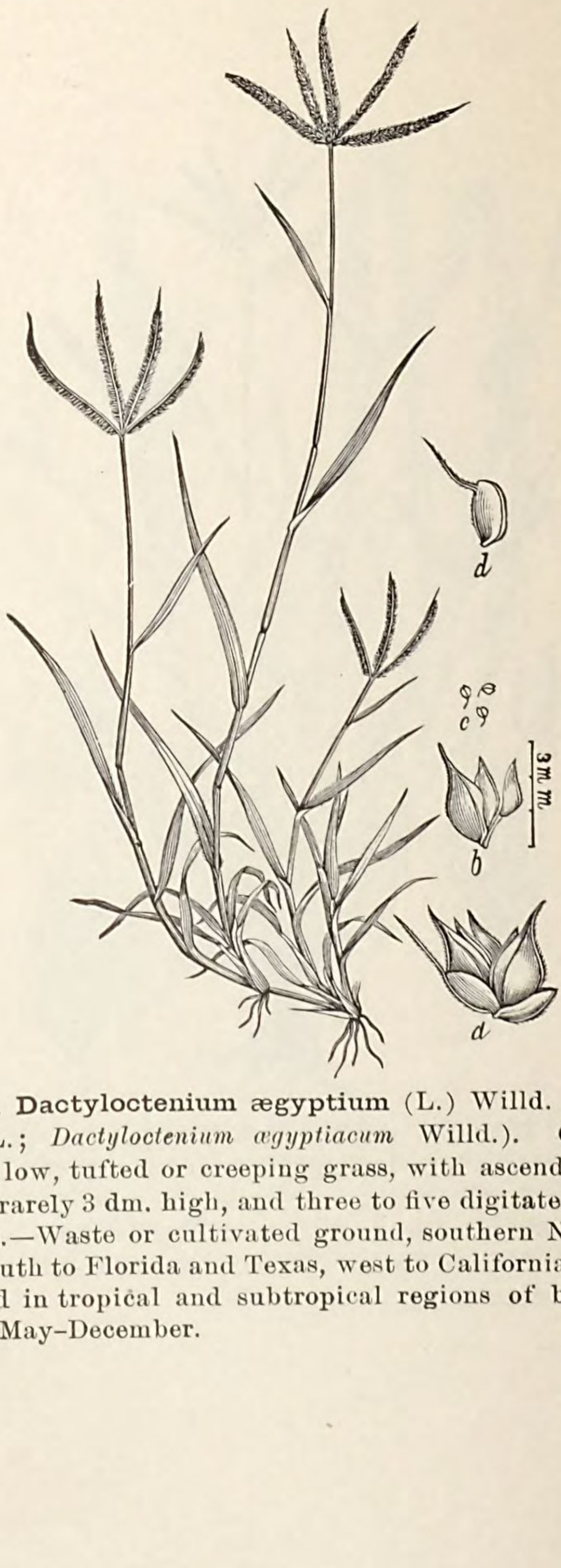

FIG. 210. **Dactyloctenium ægyptium** (L.) Willd. (*Cynosurus ægyptius* L.; *Dactyloctenium ægyptiacum* Willd.). CROWFOOT-GRASS.—A low, tufted or creeping grass, with ascending flowering stems rarely 3 dm. high, and three to five digitate spikes 2 to 5 cm. long.—Waste or cultivated ground, southern New York to Illinois, south to Florida and Texas, west to California. [Widely distributed in tropical and subtropical regions of both hemispheres.] May–December.

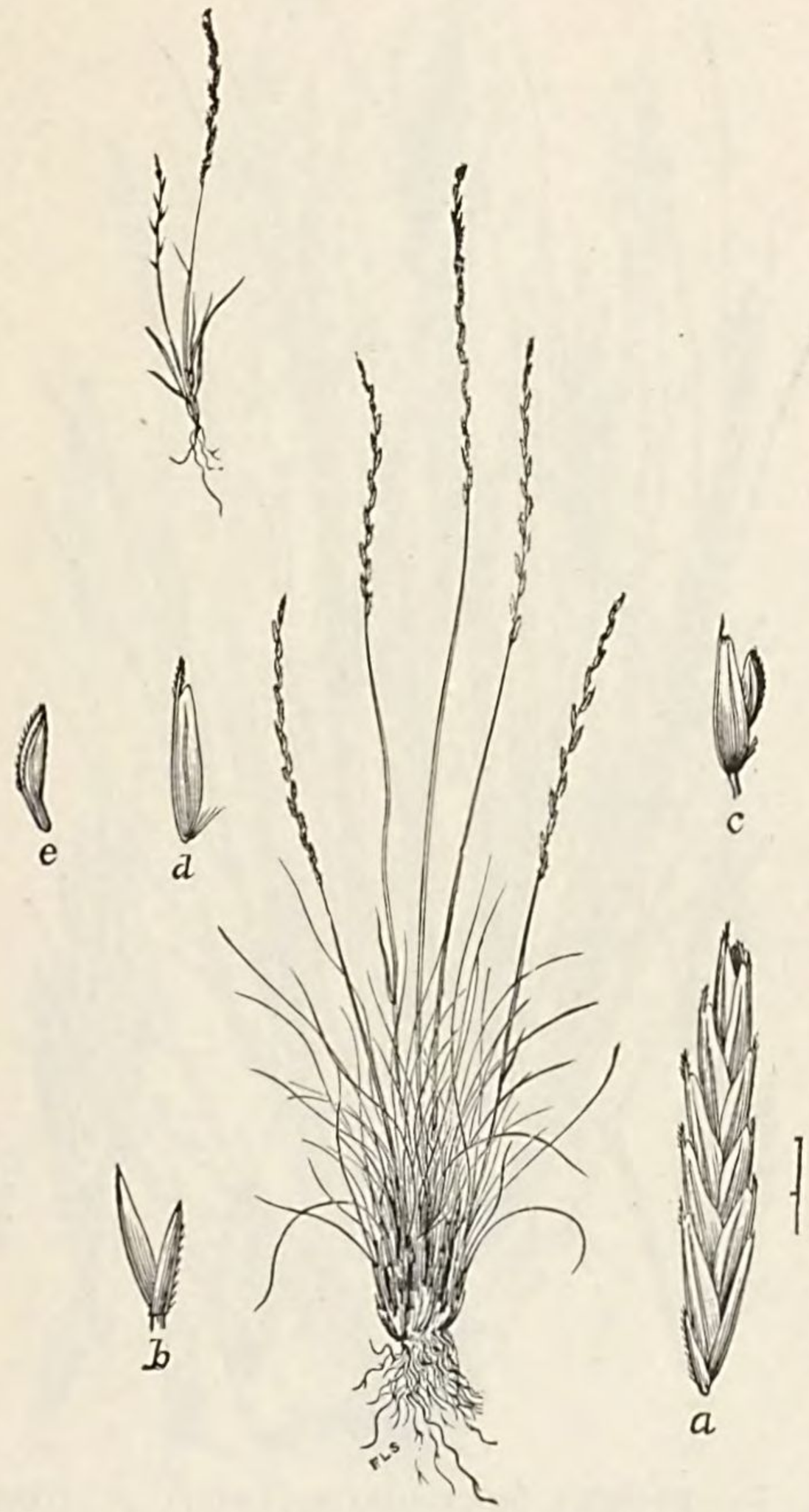

FIG. 211. **Leptochloa spicata** (Nees) Scribn. (*Bromus spicatus* Nees; *Diplachne spicata* Doell; *D. reverchoni* Vasey); Beal, Grasses N. Am., **2**: 434.—A low, densely cæspitose perennial (?), with numerous setaceous basal leaves and a slender, scape-like culm 6 to 15 cm. high.—Granitic rocks, central Texas. [Mexico and Brazil.] May–July.

FIG. 212. **Leptochloa fascicularis** (Lam.) A. Gray. CLUSTERED SALT-GRASS.—An erect, ascending or more or less diffusely spreading, cæspitose, much-branched annual 5 to 6 dm. high, with numerous, erect, crowded spikes 6 to 8 cm. long.—Salt marshes along the coast, Rhode Island to Texas; saline soil in the interior, western New York to South Dakota, Nevada, New Mexico, and Texas. [Mexico and West Indies.] July–September.

FIG. 213. **Leptochloa viscida** (Scribn.) Beal (*Diplachne viscida* Scribn.). VISCID LEPTOCHLOA.—A densely cæspitose and diffusely branched perennial (?) 0.5 to 3 (rarely 6) dm. high, with acute, flat leaves, and narrow, densely flowered panicles, composed of eight to twelve erect spikes.—Wet, clayey soil, New Mexico and Arizona. [Mexico and Lower California.] June–September.

FIG. 214. **Leptochloa imbricata** Thurb. (*Diplachne imbricata* Scribn.); Beal, Grasses N. Am., **2**: 435.—A rather stout, erect or ascending perennial 3 to 9 dm. high, with smooth, usually glaucous culms, narrow, flat leaves, and numerous crowded, erect or ascending spikes 4 to 6 cm. long.—Texas to southern California. [Mexico and Lower California.] August–November.

FIG. 215. **Leptochloa scabra** Nees (*L. langloisii* Vasey). ROUGH LEPTOCHLOA.—A stout annual 6 to 12 dm. high, with flat leaves and very many, crowded, slender spikes in terminal panicles 3 dm. long.—Ditches and fields, Louisiana. [Brazil.] September.

FIG. 216. **Leptochloa nealleyi** Vasey (*L. stricta* Fourn.). NEALLEY'S LEPTOCHLOA.—A slender, or rather stout perennial, with erect or ascending culms 4.5 to 12 dm. high, and narrow, elongated panicles of many erect or ascending spikes.—Western Texas. [Mexico.] April–June.

FIG. 217. **Leptochloa dubia** (HBK.) Nees (*Chloris dubia* HBK.; *Diplachne dubia* Scribn.); Beal, Grasses N. Am., **2**: 437.—A rather stout and apparently perennial species, 3 to 9 dm. high, with usually eight to ten approximate spreading spikes 6 to 8 cm. long.—Southern Florida, Texas to Arizona, and southward into Mexico. April–September.

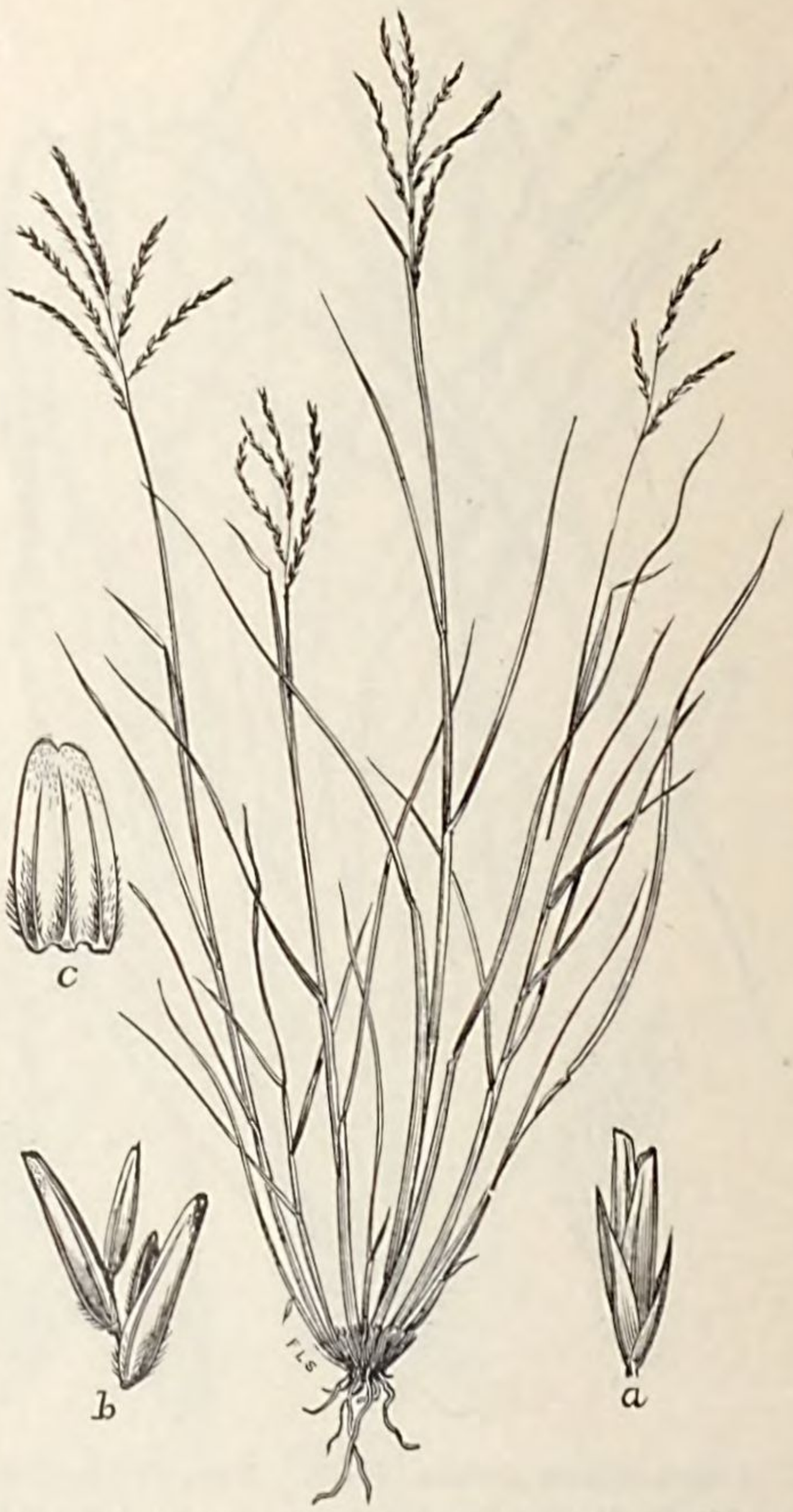

FIG. 218. **Leptochloa pringlei** (Vasey) Beal, Grasses N. Am., **2**: 436.—A rather slender perennial 2.5 to 3.5 dm. high, with narrow leaves and four to six spikes 2.5 to 5 cm. long, approximate near the summit of the culm. Spikelets two- to three-flowered.—Arizona. April, May.

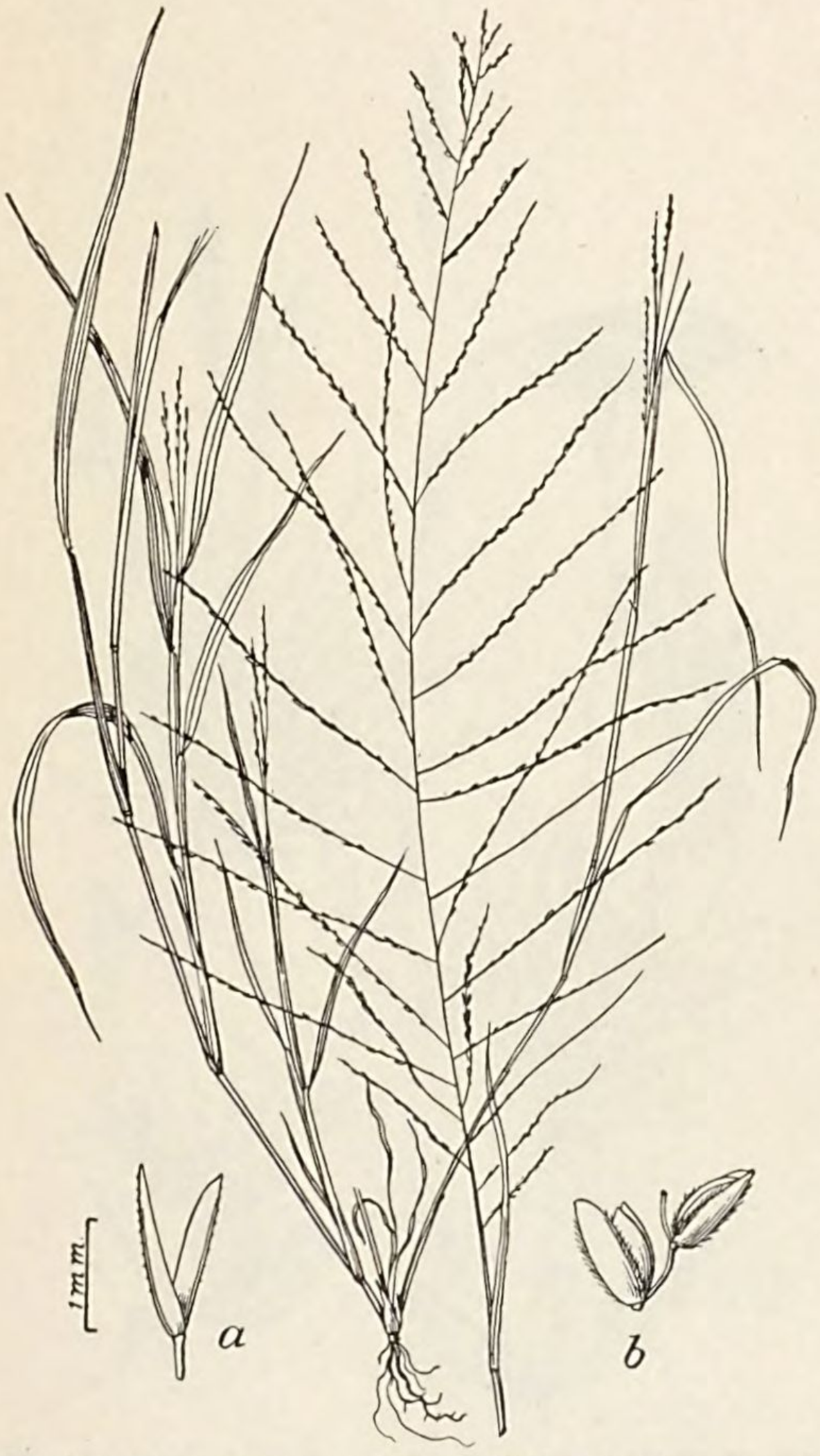

FIG. 219. **Leptochloa mucronata** (Michx.) Kunth. FEATHER-GRASS.—A more or less branching annual 6 to 12 dm. high, with rather broad, flat leaves and long terminal panicles of many slender spikes.—A weed in cultivated and waste grounds, Virginia, Illinois, Missouri, Tennessee, Alabama, Texas, Indian Territory, Arizona, and California. [Northern Mexico and Cuba.] June–October.

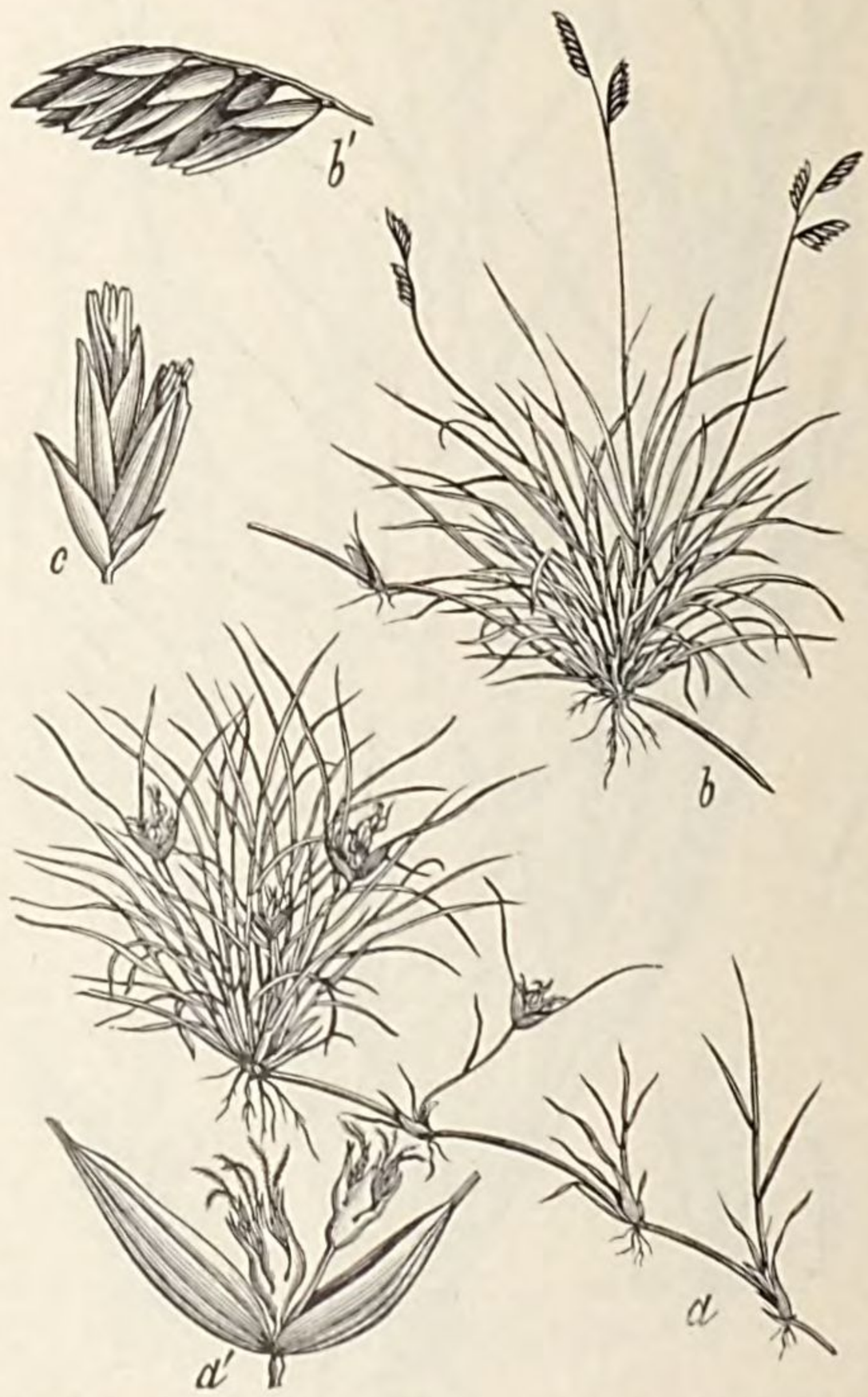

FIG. 220. **Bulbilis dactyloides** (Nutt.) Raf. (*Buchloë dactyloides* Engelm.); Britton and Brown, Ill. Fl., **1** : 183. BUFFALO-GRASS.—A low, fine-leafed, and extensively creeping perennial, rarely more than 1 to 1.5 dm. high. Similar to Bermuda in habit of growth.—Dry prairies and river bottoms, Minnesota and South Dakota (ascends to 1,650 m. in Black Hills), to Arkansas, southern Texas, and Colorado. [Mexico.] March–August.

FIG. 221. **Pappophorum wrightii** S. Wats. (*P. boreale* Torr., not Griseb.); Beal, Grasses N. Am., **2**: 448. PURPLE-GRASS.—A slender, branching and apparently annual species 2 to 4 dm. high, with narrow, involute leaves and densely flowered, spike-like, lead-colored or purplish panicles 1 to 7 cm. long.—Rocky hills, canyons, and open plains, western Texas to Arizona. [Northern Mexico.] July–September.

FIG. 222. **Pappophorum apertum** Scribn.; Bull. Torr. Bot. Club, **9**: 148; Beal, Grasses N. Am., **2**: 447.—A cæspitose perennial 3 to 8 dm. high, with long, narrow, mostly involute leaves and narrow, pale, or often straw-colored panicles 15 to 20 cm. long.—Valleys, western Texas to Arizona and Mexico. June.

FIG. 223. **Cottea pappophoroides** Kth. COTTA-GRASS.—An erect, branching perennial 3 to 6 dm. high, with narrow, flat, pilose leaves and oblong, open panicles 9 to 18 cm. long; spikelets two- to six-flowered, floral glumes many-parted.—In canyons, western Texas to Arizona. [Mexico and South America.] August–October.

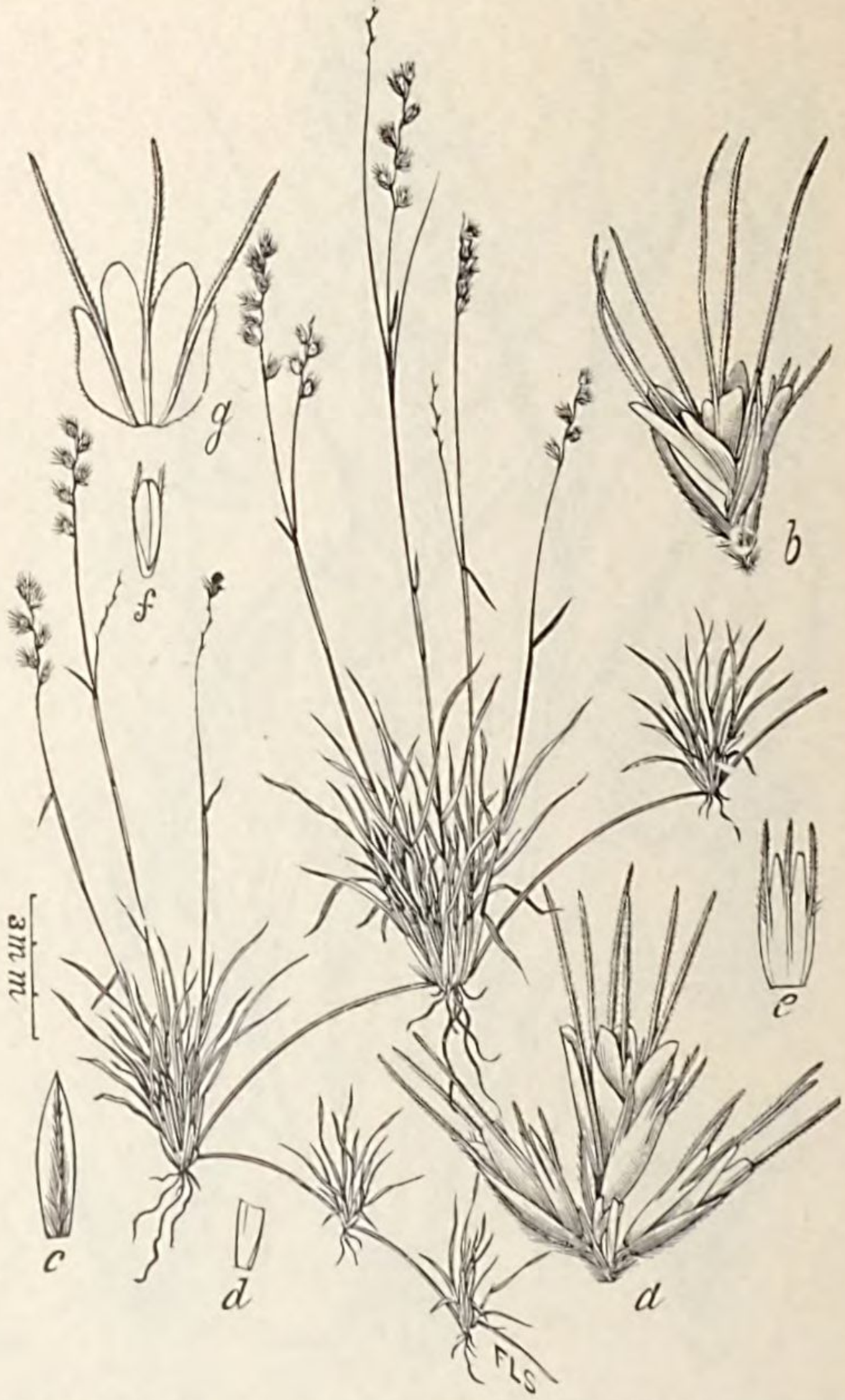

FIG. 224. **Cathestecum prostratum** Presl (*C. erectum* Vasey and Hack.); Beal, Grasses N. Am., **2** : 452.—An extensively creeping, slender perennial, with upright flowering branches 1 to 3 dm. high, narrow, flat leaves, and clustered spikelets in terminal or lateral racemes.—Dry mesas and bluffs along the Rio Grande, western Texas. [Mexico.] July–October.

FIG. 225. **Scleropogon brevifolius** Philippi (*Tricuspis monstrosa* Munro; *Lesourdia multiflora* and *L. karwinskyana* Fourn.).—A wiry, creeping perennial with densely tufted, upright, leafy branches 1 to 2.5 cm. high, and unisexual spikelets: the pistillate long-awned, the staminate awnless.—Dry mesas and canyons, Colorado to Texas, New Mexico, Arizona, and southward into Mexico and South America. May–October.

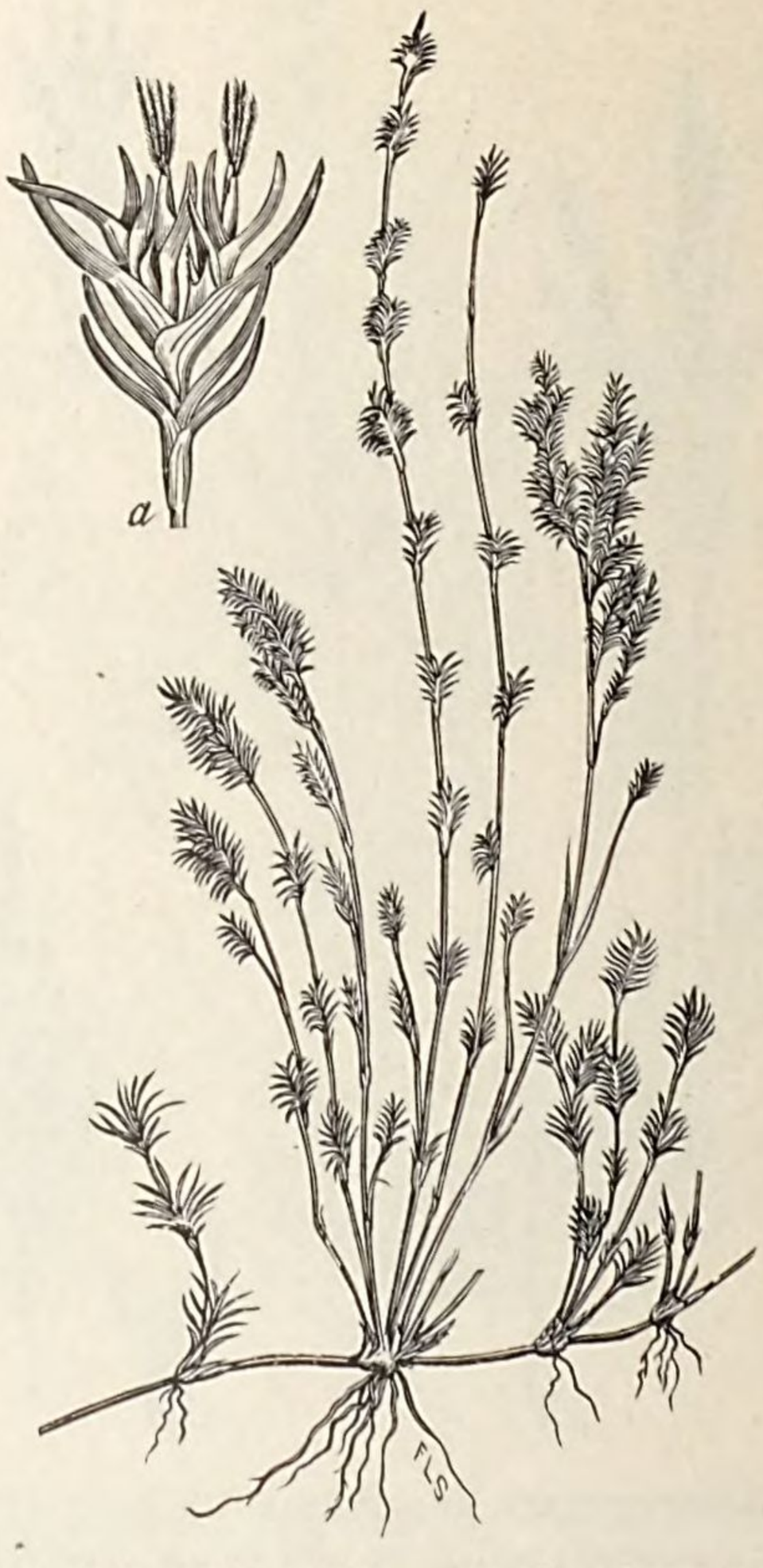

FIG. 226. **Monanthochloe littoralis** Engelm. SALT CEDAR.—A creeping grass, with hard, woody stems, and crowded, subulate, rigid leaves 2 cm. long or less.—Rocky shores and salt marshes along the coast, southern Florida, extreme southern Texas, southern California. [Lower California.] May, June.

FIG. 227. **Munroa squarrosa** (Nutt.) Torr. FALSE BUFFALO-GRASS.—A low, diffusely much-branched annual, with crowded and sharply pointed, rigid leaves 0.5 to 2.5 cm. long.—Prairies and dry plains, South Dakota to Texas, west to Alberta, Montana, Colorado, and Arizona. June–October.

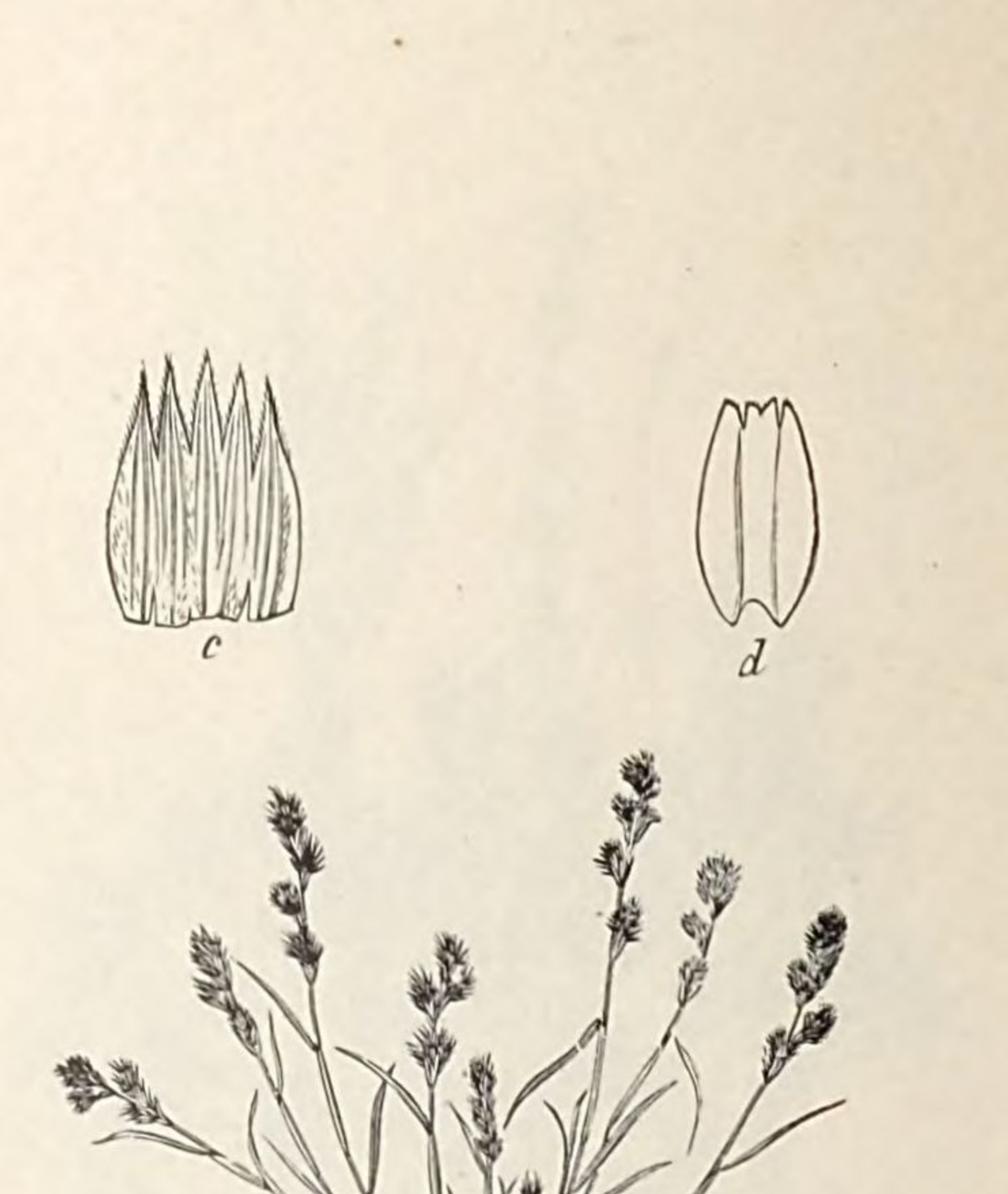

FIG. 228. **Orcuttia californica** Vasey; Beal, Grasses N. Am., **2**: 457.—A low, much-branched, cæspitose annual 0.5 to 1 dm. high, the numerous stems bearing three to six spikelets near the apex.—Southern and Lower California. April.

FIG. 229. **Phragmites vulgaris** (Lam.) B. S. P. (*P. communis* Trin.; *Arundo vulgaris* Lam.; *A. phragmites* L.). COMMON REED.—A tall, stout, perennial grass, with stout, creeping rootstocks, numerous broad, attenuate-pointed leaves, and a large ovoid-pyramidal, purplish, terminal panicle.—Margins of lakes and rivers and in brackish coast marshes, almost everywhere in the United States and southern British America. [Widely distributed in temperate regions of both hemispheres.] August–October.

FIG. 230. **Triodia eragrostoides** Vasey & Scribn. (*Sieglingia eragrostoides* Dewey); Beal, Grasses N. Am., **2**: 465.—An erect, leafy perennial 6 to 9 dm. high, with long, narrow leaves and open, small-flowered panicles 2 to 3 dm. long.—Rocky banks, etc., southern Texas, southern Florida. [Northeastern Mexico.] June-October.

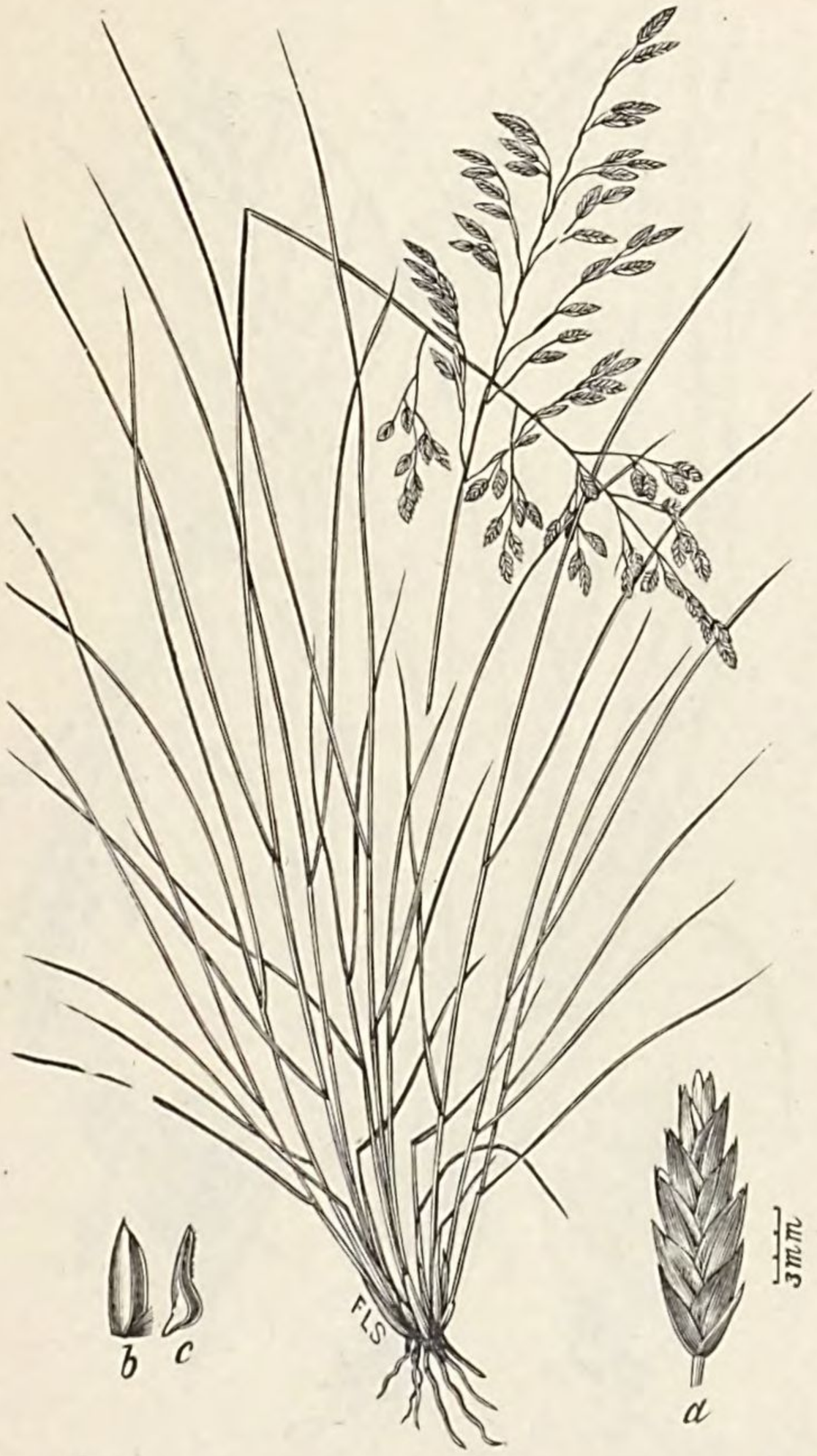

FIG. 231. **Triodia texana** S. Wats.; Beal, Grasses N. Am., **2**: 466.—A slender, wiry grass 3 to 6 dm. high, with very narrow leaves and loosely few-flowered, nodding panicles 10 to 15 cm. long.—Rich valley land, dry places, etc., Louisiana and Texas to Arizona. [Northern Mexico.] June–August.

FIG. 232. **Triodia ambigua** (Ell.) Vasey; Beal, Grasses N. Am., **2**: 465, sub. *Sieglingia* (*Poa ambigua* Ell.).—An erect perennial 6 to 12 dm. high, with narrow, flat leaves and open, pyramidal panicles 10 to 20 cm. long.—Dry, open, pine barrens near the coast, South Carolina to Texas. July–October.

FIG. 233. **Triodia albescens** (Munro) Vasey (*Sieglingia albescens* Kuntze); Beal, Grasses N. Am., **2**: 469. WHITE TOP.—A cæspitose, erect perennial 4 to 7 dm. high, with narrow, flat leaves and densely flowered, spike-like panicles 9 to 15 cm. long.—Texas. August–October.

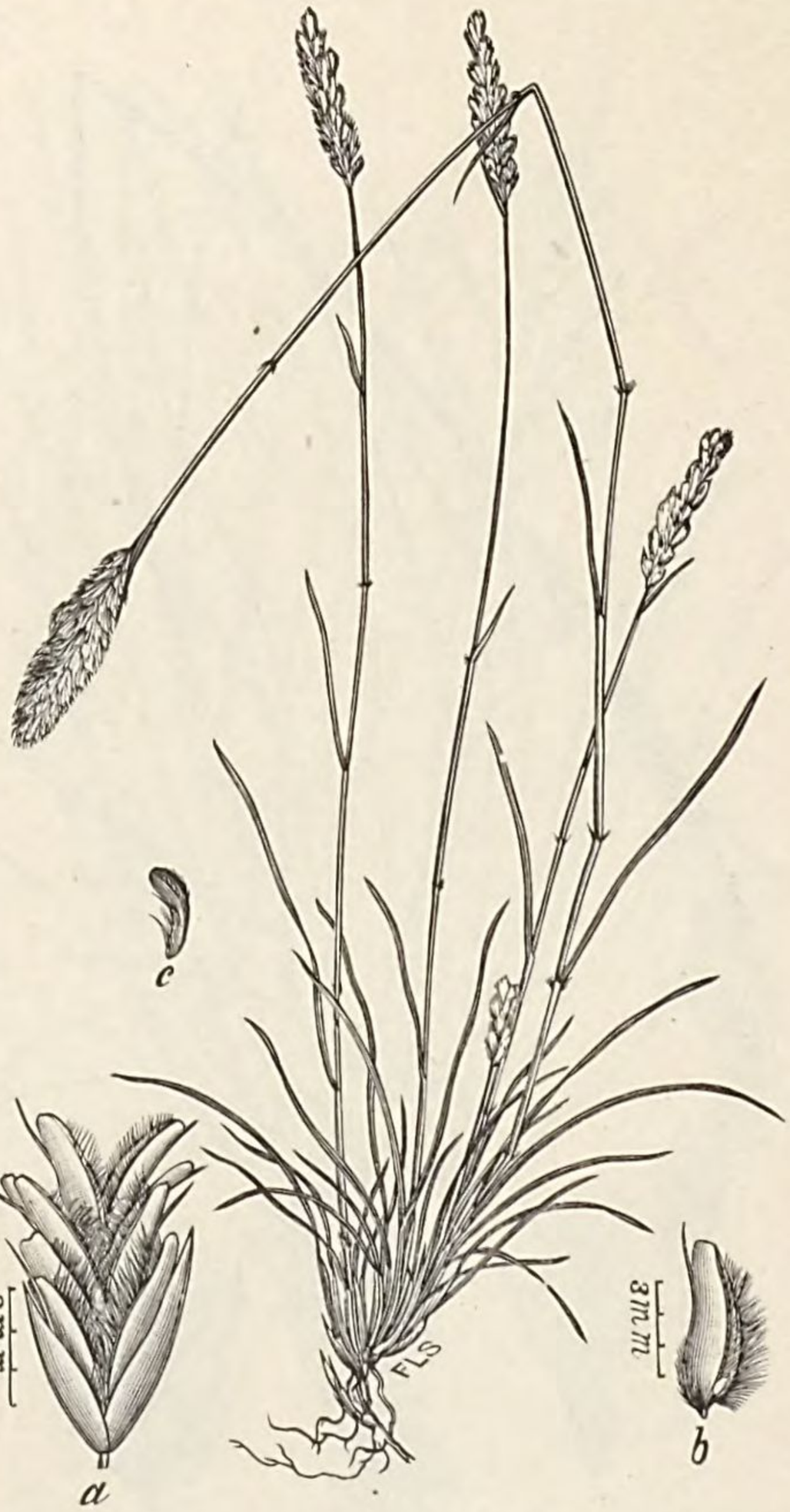

FIG. 234. **Triodia nealleyi** Vasey; Bull. Torr. Bot. Club., **15**: 49 (1888); (*Sieglingia nealleyi* Dewey; Beal, Grasses N. Am., **2**: 470).—A slender, glaucous, cæspitose perennial, 3 to 4 dm. high, with flat or conduplicate leaves, and densely flowered, linear or ovoid panicles 4 to 5 cm. long.—Canyons and ridges, southwestern Texas. September.

FIG. 235. **Triodia acuminata** (Munro) Vasey (*Sieglingia acuminata* Kuntze); Beal, Grasses N. Am., **2**: 470.—A slender, densely tufted perennial 1.5 to 2 dm. high, with short leaves, and simple, dense, oblong panicles 1.5 to 3 cm. long.—Poor, gravelly soil, hillsides, etc., Texas to Arizona, north to Colorado and Indian Territory. [Northern Mexico.] April–June.

FIG. 236. **Triodia pulchella** HBK. (*Sieglingia pulchella* Kuntze); Beal, Grasses N. Am., **2**: 468.—A low, densely tufted and often creeping perennial 2 to 15 cm. high, with very narrow leaves and crowded spikelets in clusters of three to six, which are equaled or exceeded by the upper leaves.—Western Texas to Nevada and southern California. [Northern Mexico.] February–June.

FIG. 237. **Triplasis americana** Beauv. (*Sieglingia americana* Beal, Grasses N. Am., **2**: 466).—A slender, cæspitose grass, with wiry culms 4 to 9 dm. high, rather short, narrow leaves, and few-flowered, simple panicles 3 to 10 cm. long; the pubescent awns 5 to 7 mm. long.—Dry, sandy soil near the coast, North Carolina to Mississippi. July–October.

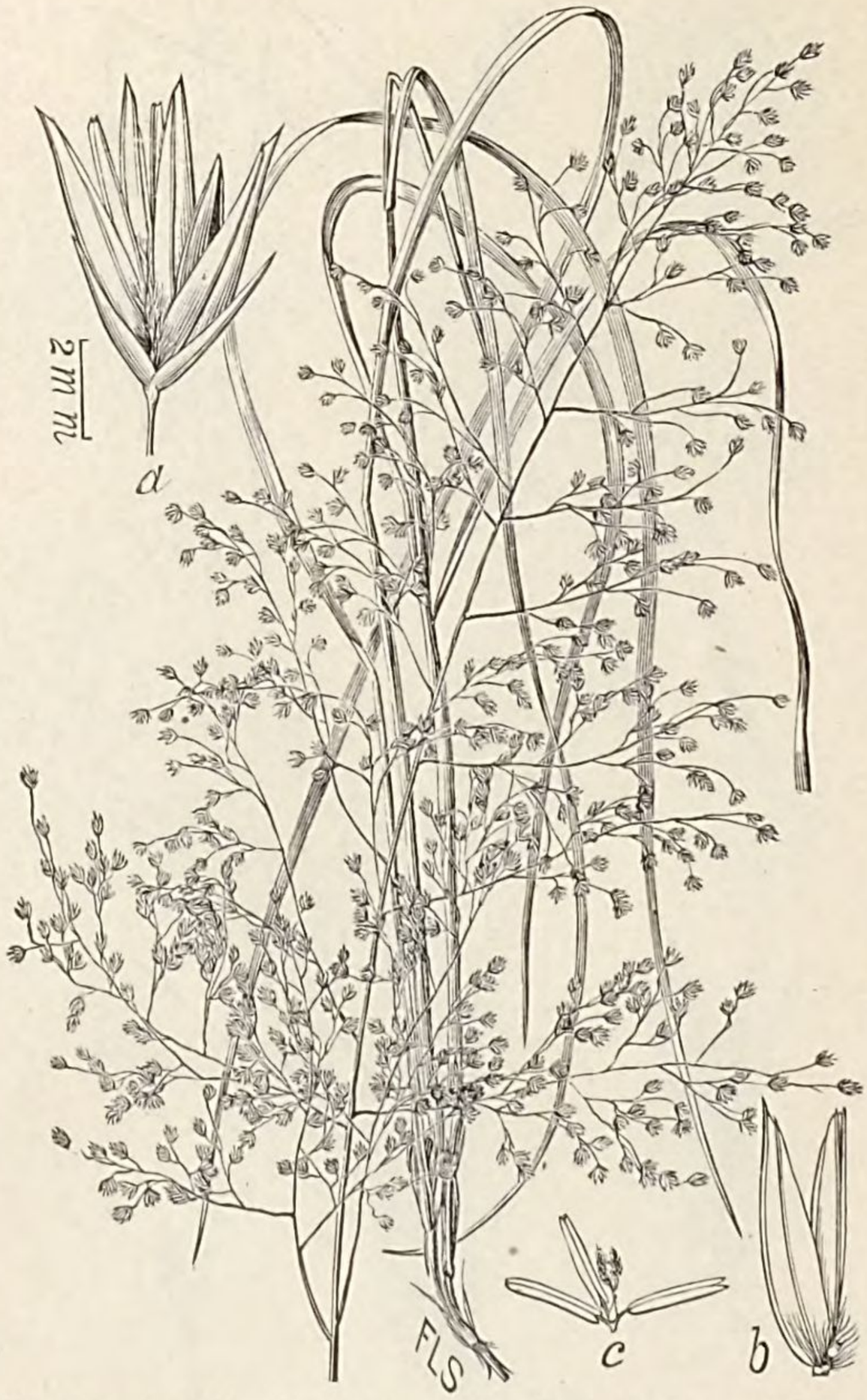

FIG. 238. **Redfieldia flexuosa** (Thurb.) Vasey (*Graphephorum* (?) *flexuosum* Thurb.); Britton and Brown, Ill. Fl., **1**: 186. REDFIELD'S-GRASS.—A stout, native perennial 6 to 12 dm. high, with very long, narrow leaves and diffuse, capillary panicles 25 to 60 cm. long.—Sand hills and "blow-outs," Kansas and Nebraska to Indian Territory, Colorado, and Wyoming. July, August.

FIG. 239. **Dissanthelium californicum** (Nutt.) Benth.; Beal, Grasses N. Am., **2**: 473 (*Stenochloa californica* Nutt.).—A slender, glabrous, branching annual 1 to 3 dm. high, with short, narrow leaves and contracted, spike-like panicles 4 to 8 cm. long.—Santa Catalina Island, southern California, and Guadaloupe Islands, Lower California. September.

FIG. 240. **Eragrostis neo-mexicana** Vasey; Beal, Grasses N. Am., **2**: 485. CRAB-GRASS (in New Mexico).—A rather stout, branching and leafy annual 3 to 12 dm. high, with flat leaves and ample, diffuse panicles 20 to 40 cm. long.—Texas to southern California (ascends to 1,500 m. in Arizona). August. A valuable hay grass resembling Teff (*E. abyssinica*).

FIG. 241. **Eragrostis purshii** Schrad. SOUTHERN SPEAR-GRASS.—An annual, 1 to 4 dm. high, with the erect or ascending culms diffusely branching near the base, and diffuse panicles of small, spreading spikelets.—Sandy river banks, waste ground, etc., Massachusetts and Ontario to South Dakota and California, south to Florida, Texas, and Arizona. [Mexico.] June–October.

FIG. 242. **Eragrostis curtipedicellata** Buckl.; Britton and Brown, Ill. Fl., **1**: 190. SHORT-STALKED ERAGROSTIS.—A rather rigid, branching perennial 3 to 9 dm. high, with flat, spreading leaves and diffuse panicles 20 to 30 cm. long. Related to *E. pectinacea*.—Prairies, Kansas, Indian Territory, and Texas. July–September.

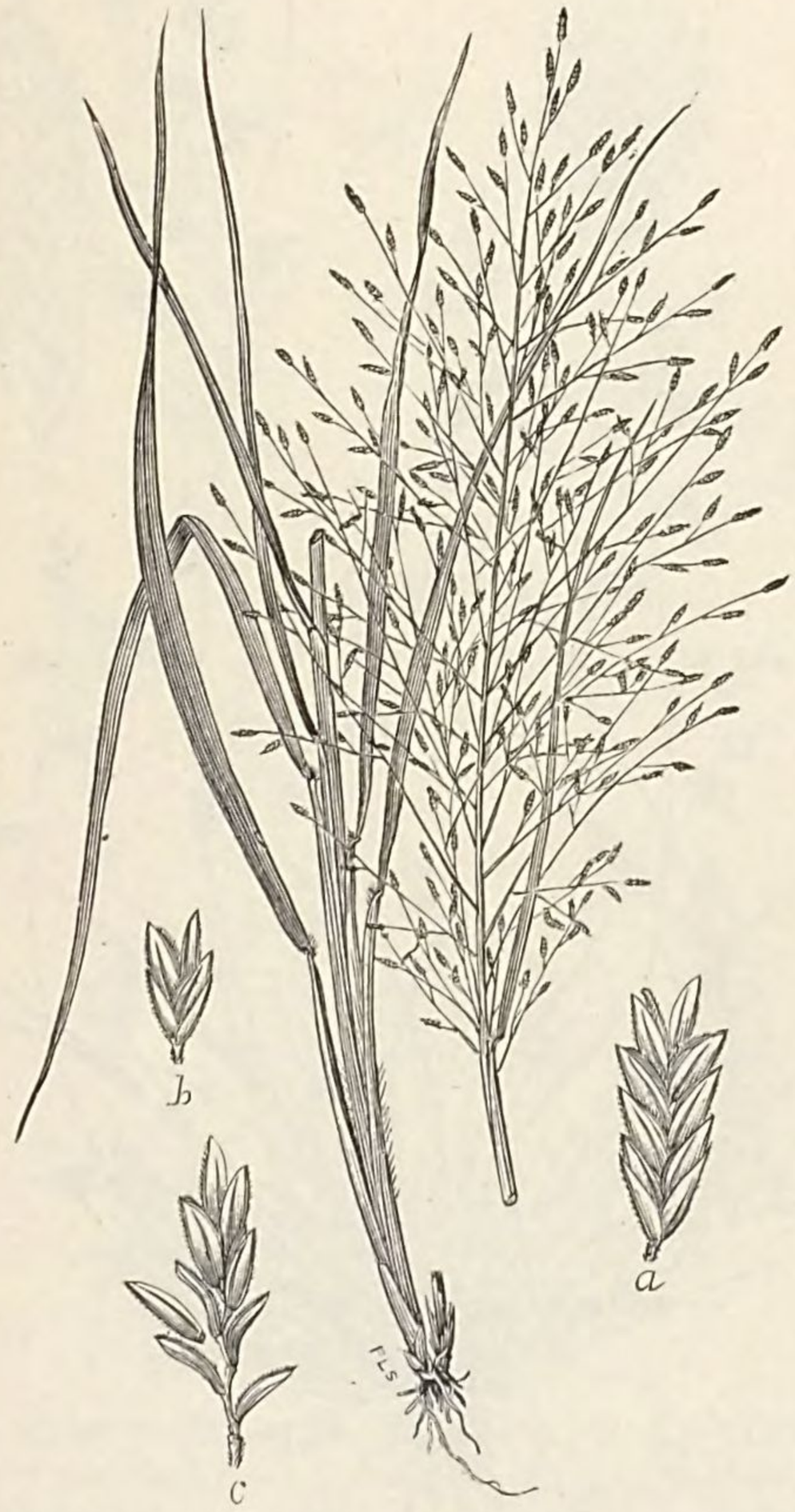

FIG. 243. **Eragrostis pectinacea** (Michx.) Steud.—An erect, cæspitose perennial 3 to 9 dm. high, with a short, stout rootstock and large, spreading, red-purple panicles.—Dry, sandy soil in the open, Massachusetts to South Dakota and Colorado, south to Florida and Texas. July–October.

FIG. 244. **Eragrostis brownei** Nees (?).—A widely spreading, branching perennial, with somewhat wiry culms 2 to 5 dm. long, and narrow, simple, more or less interrupted panicles of nearly sessile, ten- to forty-flowered spikelets.—Dooryards and waste ground, Florida. [Widely distributed in tropical and subtropical regions.] July–October.

FIG. 245. **Eragrostis hypnoides** (Lam.) B. S. P. (*Poa hypnoides* Lam.; *E. reptans* Nees).—A prostrate, much-branched, and extensively creeping annual, with ascending, flowering branches 7.5 to 15 cm. high, spreading leaf blades, narrow and lax or very dense panicles and long, linear-lanceolate, strongly compressed spikelets.—In ditches and sandy banks of streams, Vermont and Ontario to Florida, Texas, California, and Washington. [Mexico, West Indies, and South America.] March–October.

FIG. 246. **Eragrostis glomerata** (Walt.) L. H. Dewey (*Poa glomerata* Walt.; *P. conferta* Ell.; *Eragrostis conferta* Trin.).—An erect, rather stout, branching annual 6 to 9 dm. high, with smooth sheaths and leaves, and elongated, densely flowered, light-colored panicles 25 to 60 cm. long.—Low grounds, South Carolina to Florida and westward to Texas. [Cuba, Mexico, and South America.] August–November.

FIG. 247. **Eragrostis frankii** Steud. SHORT-STALKED MEADOW-GRASS.—A low, diffusely branched annual 0.8 to 1.5 dm. high, with open, many-flowered panicles 5 to 12 cm. long.—Low, sandy ground in the open, southern New York to Minnesota, south to Georgia, Louisiana, and Kansas. August–October.

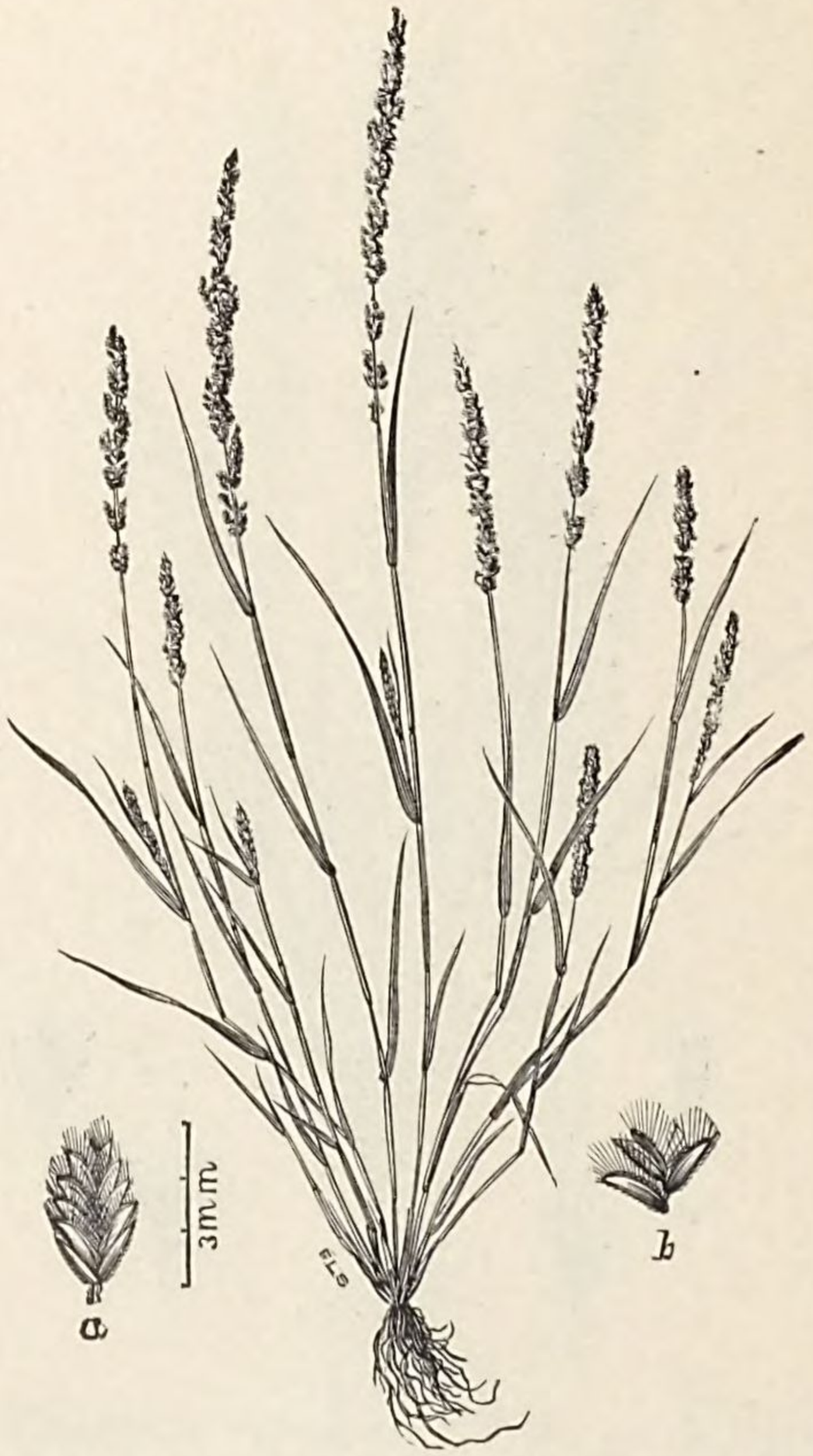

FIG. 248. **Eragrostis ciliaris** (L.) Link (*Poa ciliaris* L.).—**A** diffusely branching, slender annual 2 to 5 dm. high, with thin, narrow leaves and densely flowered, cylindrical, spike-like, more or less interrupted panicles 5 to 10 cm. long.—Cultivated and waste ground, Georgia and Florida to Mississippi. [Mexico, West Indies, and Asia.] July–October.

FIG. 249. **Eragrostis plumosa** Link. (*E. ciliaris patens* Chapm.).—A slender, diffusely branching annual 1 to 4 dm. high, with flat leaves and oblong, open panicles 5 to 15 cm. long.—Cultivated and waste ground, southern Georgia and Florida. [Widely distributed in tropical countries.] July–November.

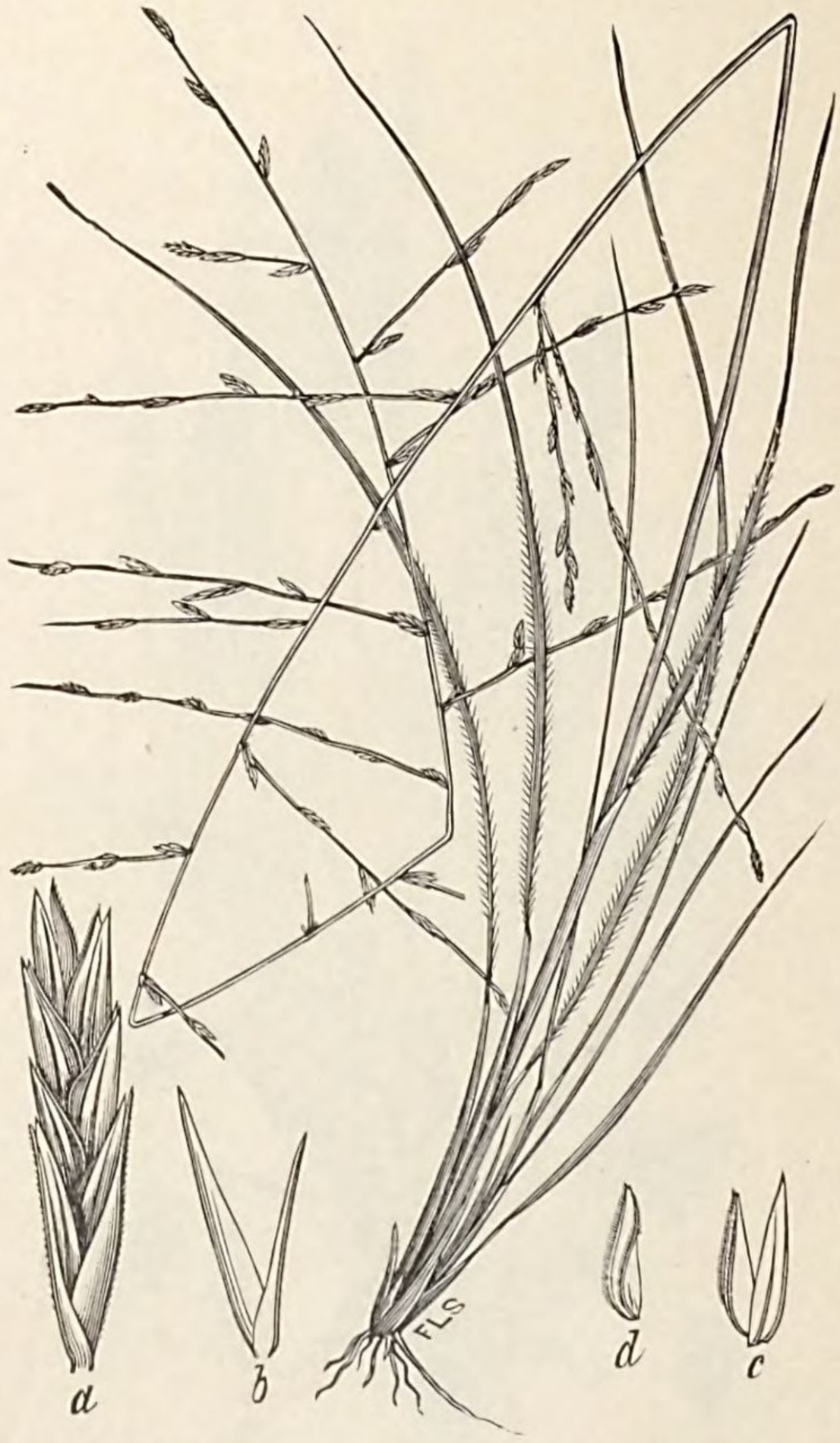

FIG. 250. **Eragrostis sessilispica** Buckl.; Britton and Brown, Ill. Fl., **1**: 190 (*Diplachne rigida* Vasey).—A smooth, wiry, cæspitose perennial 3 to 9 dm. high, with narrow, mostly involute leaves and pyramidal panicles, the five- to twelve-flowered, appressed spikelets sessile along the spreading branches.—**Dry prairies, Kansas to Texas. June-October.**

FIG. 251. **Eatonia pennsylvanica** (DC.) A. Gray. EATON'S-GRASS.—A slender, pale-green perennial, with flat leaf blades and narrow terminal panicles.—Wet meadows, low woods, and thickets, Newfoundland and Maine to British Columbia and Washington, south to Georgia, Mississippi, Texas, and Arizona. April–August.

FIG. 252. **Eatonia obtusata** (Michx.) A. Gray. EARLY BUNCH-GRASS.—A tufted perennial 4.5 to 6 dm. high, with flat leaf blades and rather densely flowered, nodding panicles.—Low ground, chiefly along streams, usually in shade, Massachusetts and Ontario to Assiniboia and British Columbia, south to Florida, Texas, and southern California. March–August.

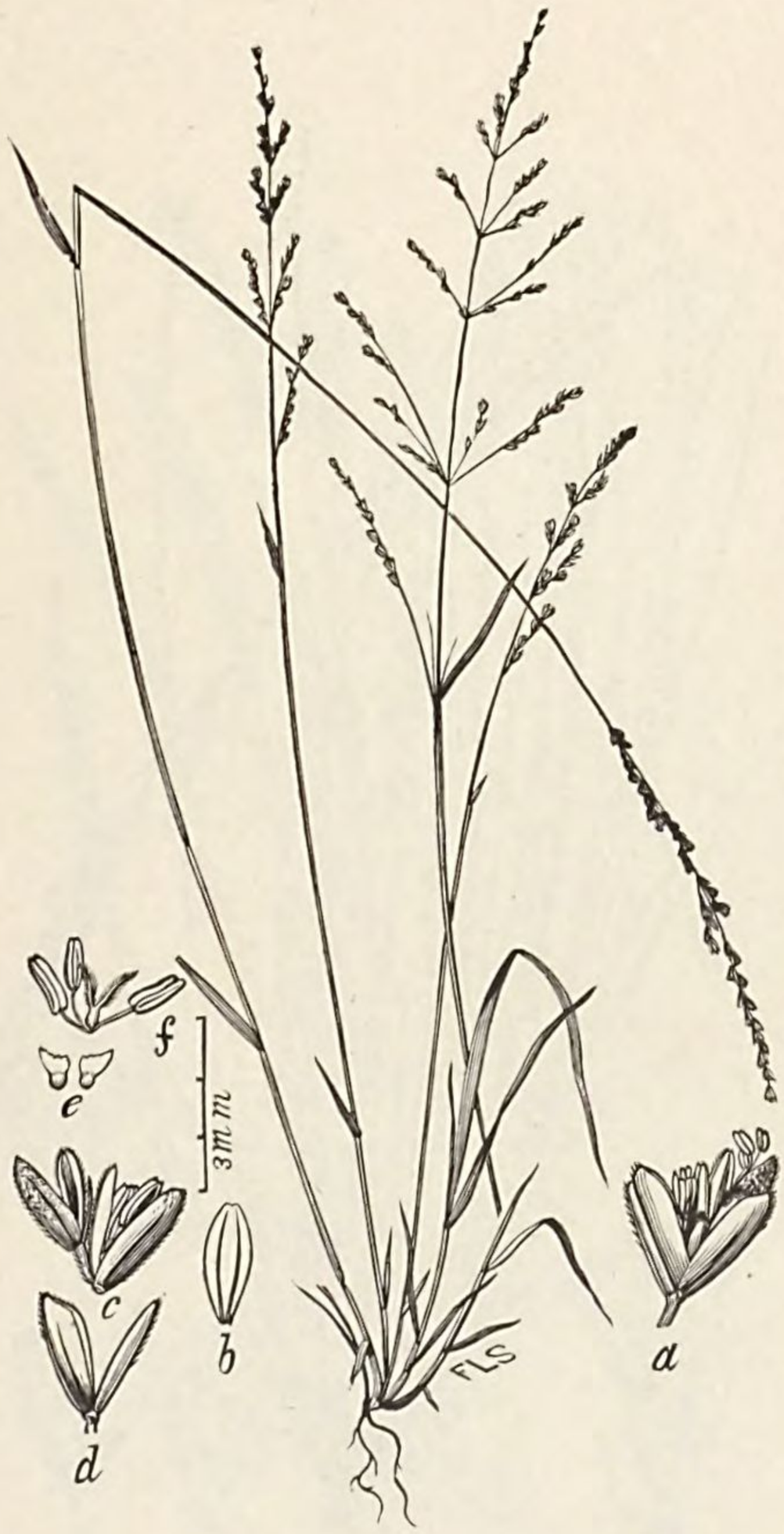

FIG. 253. **Eatonia nitida** (Sprengel) Nash (*Aira nitida* Spr.; *Eatonia dudleyi* Vasey).—A slender, erect, and cæspitose perennial 3 to 6 dm. high, with short, flat, spreading leaves and rather few-flowered, nodding panicles.—Dry, open woodlands, Rhode Island and New York westward to North Dakota, and southward to North Carolina, Mississippi and Texas. April–June.

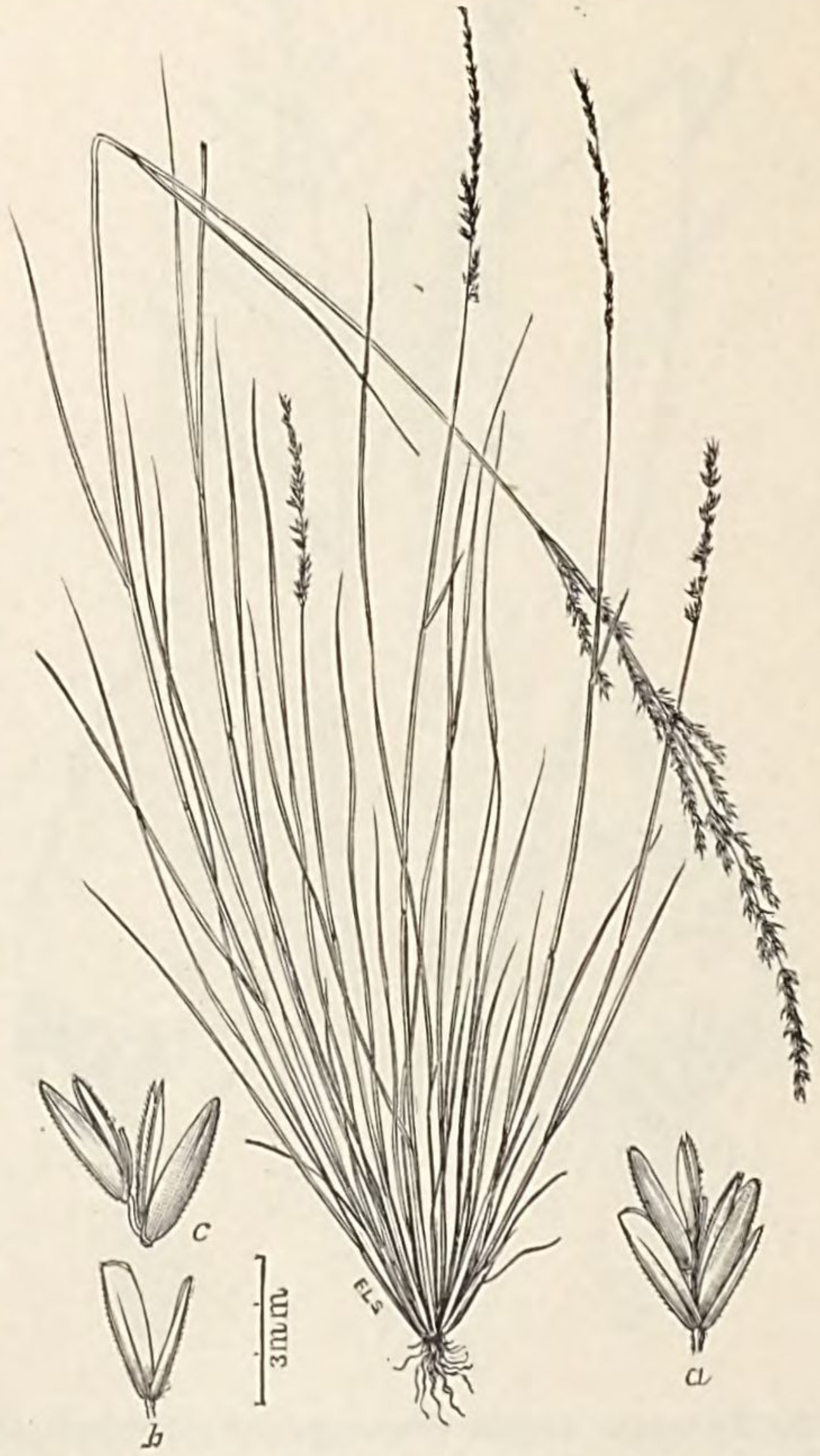

FIG. 254. **Eatonia filiformis** (Chapm.) Vasey; Beal, Grasses, N. Am., **2**: 491.—An erect, tufted perennial 3 to 6 dm. high, with very long upper internodes and long, involute, radical leaves.—Dry, sandy soil, South Carolina, Florida and Texas, north to western Tennessee. March, April.

FIG. 255. **Cynosurus cristatus** L. DOG'S-TAIL-GRASS.—A slender, erect perennial 3 to 7½ dm. high, with narrow leaves and rather slender, erect, spike-like panicles.—Sparingly established in fields and waysides, Newfoundland to Ontario, south to New Jersey; Portland, Oregon. [Europe.] June-August.

FIG. 256. **Catabrosa aquatica** (L.) Beauv.; Britton and Brown, Ill. Fl., **1**: 194. WATER WHORL-GRASS.—A smooth, soft perennial, with creeping or ascending culms 2 to 6 dm. long, flat leaves and open panicles 5 to 20 cm. long, the spreading branches in whorls.—In swales and along brooks, often in shallow water, Newfoundland and Labrador, to Quebec and Alaska, south to Nebraska, Colorado, and Utah. [Europe and Asia.] June–August.

FIG. 257. **Melica mutica** Walt. (*M. glabra* Mx.).—A slender, loosely cæspitose, wiry grass 6 to 9 dm. high, with flat leaves and simple or racemose panicles of rather large, nodding, two- to three-flowered spikelets.—Dry, rocky, open woods and thickets, Pennsylvania to Florida and westward to Wisconsin and Texas. March–May.

FIG. 258. **Melica parviflora** (Porter) Scribn. (*M. mutica parviflora* Porter; *M. porteri*, Scribn.).—A rather slender, erect, smooth perennial 4 to 7 dm. high, with flat leaves and narrow panicles 15 to 25 cm. long. Spikelets pendulous and racemose along the panicle branches.—Shaded canyons, mountains of Colorado, New Mexico, Arizona and prairies of Missouri, Kansas, and western Texas. [Northern Mexico.] July-September.

FIG. 259. **Melica spectabilis** Scribn.; Beal, Grasses N. Am., **2**: 506.—A cæspitose, stoloniferous species 3 to 6 dm. high, with scabrous, flat leaves, and loosely flowered, nodding, simple panicles 10 to 20 cm. long.—Damp grassy meadows, rich bottom lands, dry hillsides, etc. (alt. 950 to 2,400 m.), Montana to Washington and Oregon, south to Colorado, Wyoming, and Nevada. June–September.

FIG. 260. **Melica stricta** Boland. Beal, Grasses N. Am., **2**: 503. LARGE-FLOWERED MELICA.—A densely cæspitose perennial 2 to 5 dm. high from a bulbous base, with flat, more or less pubescent leaves, and simple, one-sided panicles 10 to 15 cm. long, bearing ten to twenty spikelets.—Dry ridges among rocks (alt. 1,850 to 2,700 m.), Nevada, California, and Oregon. June–August.

FIG. 261. **Melica bulbosa** Geyer; Beal, Grasses N. Am. **2**: 508. THICK-ROOTED BUNCH-GRASS.—A slender, erect perennial 3 to 6 or rarely 9 dm. high, bulbous at the base, with erect leaves and a narrow, somewhat spike-like panicle 10 to 15 cm. long.—Dry rocky slopes, moist shady mountain sides, etc. (alt. 900 to 2,700 m.), Montana and Wyoming to British Columbia, south to Utah, Nevada, and Oregon; western Texas. May–July.

FIG. 262. **Korycarpus diandrus** (Michx.) Kuntze; Britton and Brown, Ill. Fl., **1**: 196; (*Diarrhena americana* Beauv.).—An erect perennial 6 to 9 dm. high, with long, narrow-lanceolate, nearly erect leaves and a few-flowered, simple panicle 10 to 25 cm. long.—Rich, rocky, wooded hillsides, Ohio to South Dakota, south to Georgia, Arkansas, and Indian Territory. August, September.

FIG. 263. **Pleuropogon refractum** (A. Gray) Benth. (*Lophochlæna refracta* A. Gray); Beal, Grasses N. Am., **2**: 514. NODDING PLEUROPOGON.—A slender perennial 6 to 12 dm. high from creeping rootstocks, with flat leaves and terminal racemes of six to ten drooping spikelets 2 to 3 cm. long.—In swamps and along mountain streams (alt. 1,200 to 3,850 m.), California to Washington. May–August.

FIG. 264. **Uniola latifolia** Michx. BROAD-LEAFED SPIKE-GRASS.—An erect grass, with rather stout, simple culms 6 to 12 dm. high, broad, spreading leaf blades and a drooping panicle of large, flat spikelets 2 to 3 cm. long.—Low thickets and shaded banks of streams, Pennsylvania to Florida, west to Illinois, Kansas, and Texas. June–October.

FIG. 265. **Uniola paniculata** L.; Beal, Grasses N. Am., **2**: 516. SEASIDE OATS.—A stout, native perennial 9 to 15 dm. high, with long, rigid leaves and showy, nodding panicles of many broad and pale straw-colored spikelets.—Drifting sand of sea beaches, Virginia to Texas. [West Indies and South America.] May–October.

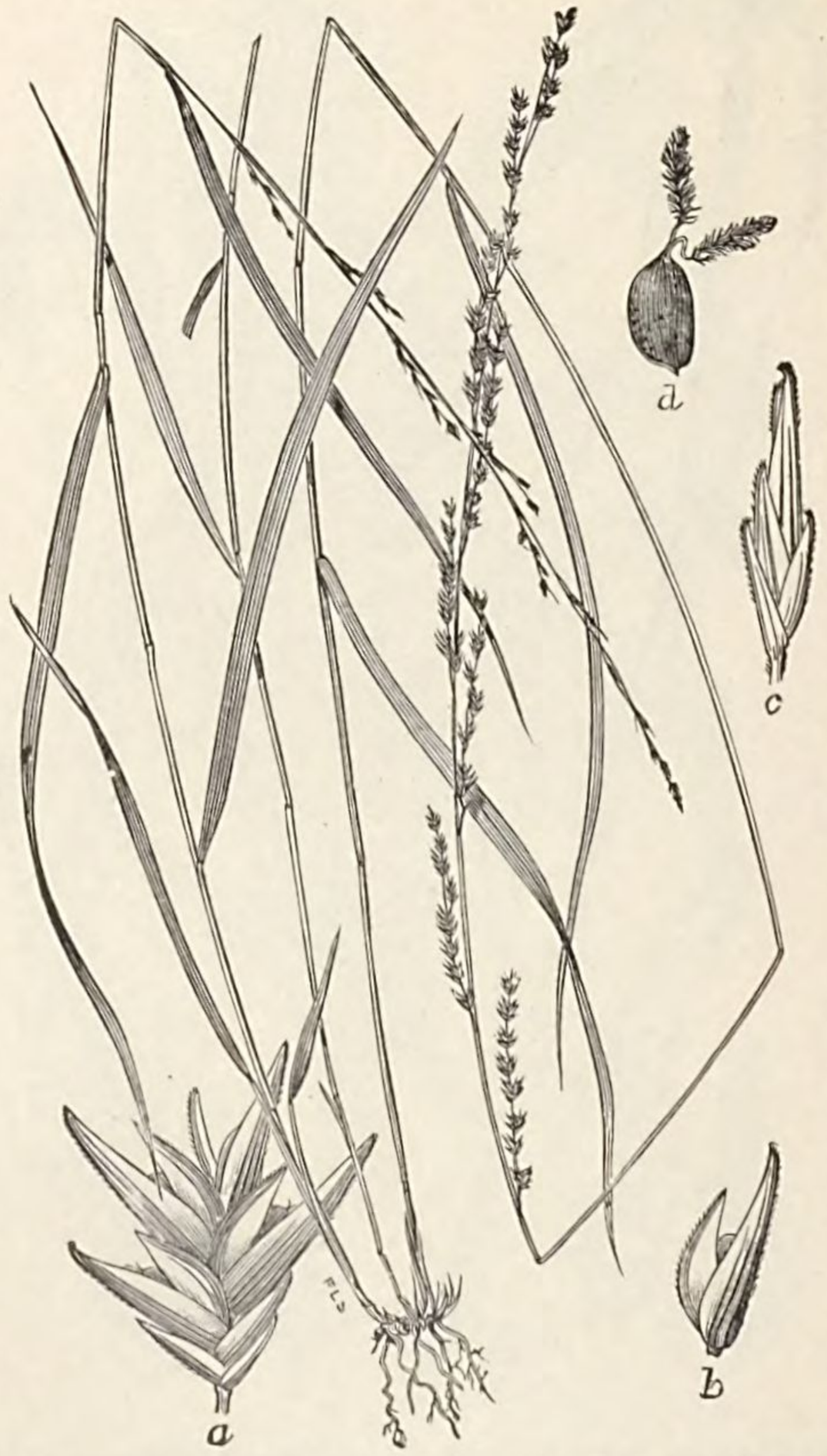

FIG. 266. **Uniola laxa** (L.) B. S. P.; Britton and Brown, Ill. Fl., **1**: 197 (*U. gracilis* Michx.).—A slender grass 6 to 9 dm. high, with long, narrow leaf-blades, and a contracted, wand-like, nodding panicle 15 to 45 cm. long.—In dry soil, open woods, and banks, Long Island to Florida, west to Kentucky, Tennessee, and Texas. June-October.

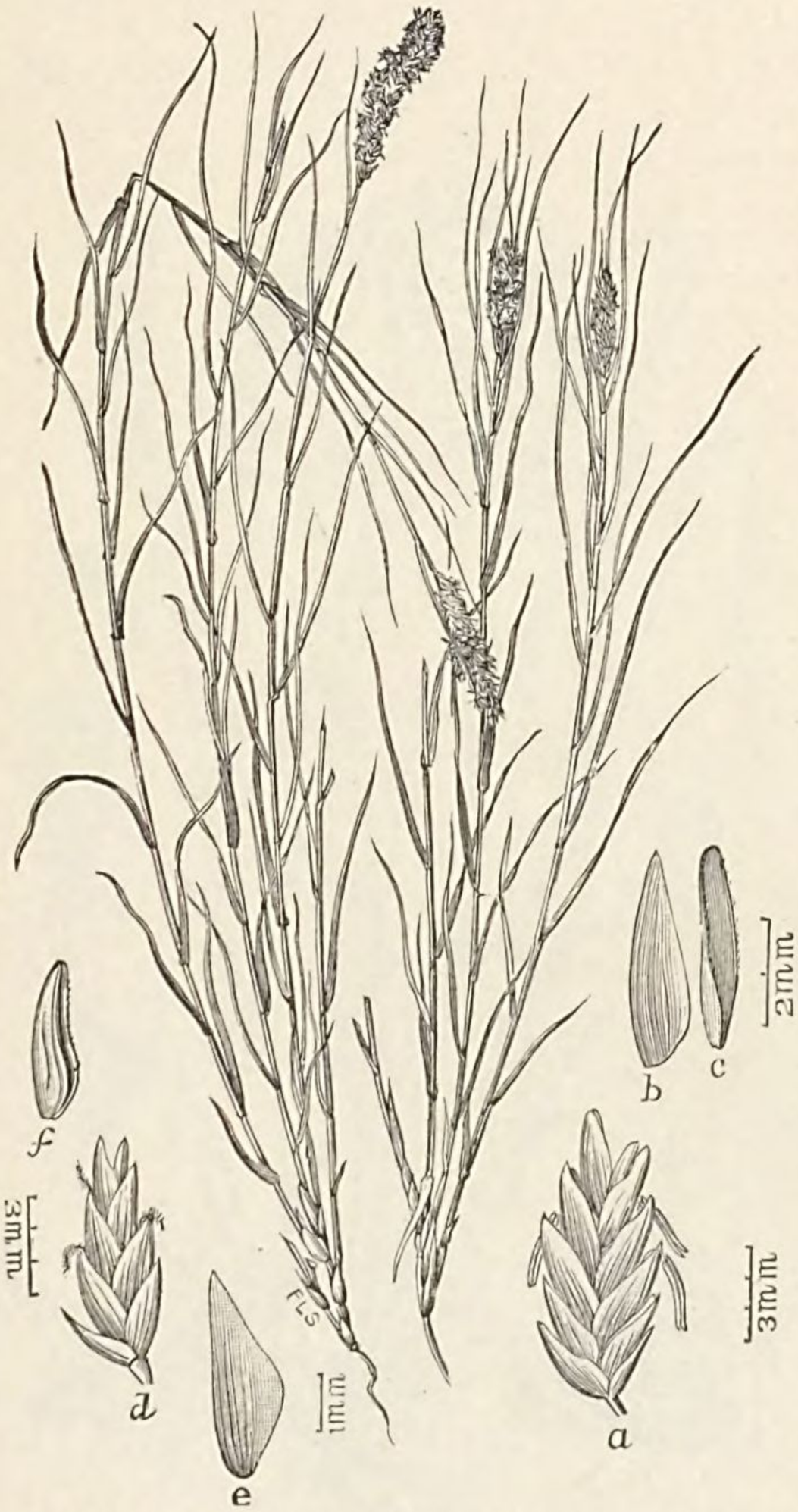

FIG. 267. **Distichlis spicata** (L.) Greene; Britton and Brown, Ill. Fl., **1**: 198 (*D. maritima* Raf.). ALKALI-GRASS.—An upright, wiry grass, 2.5 to 5 dm. high, with strong and widely creeping rootstocks, rather rigid leaves, and densely flowered panicles. The grass is diœcious.—Salt marshes along the coast, Maine to Texas and British Columbia to California; alkaline soil in the interior, Nebraska and Kansas to Montana, eastern Washington, California, and New Mexico. May-August.

FIG. 268. **Briza media** L. QUAKING-GRASS.—A slender, erect perennial, with rather short, flat leaf-blades and capillary, spreading panicles.—Sparingly naturalized in fields and waste ground, in Ontario, New England, and California. [Europe and Asia.] May–July.

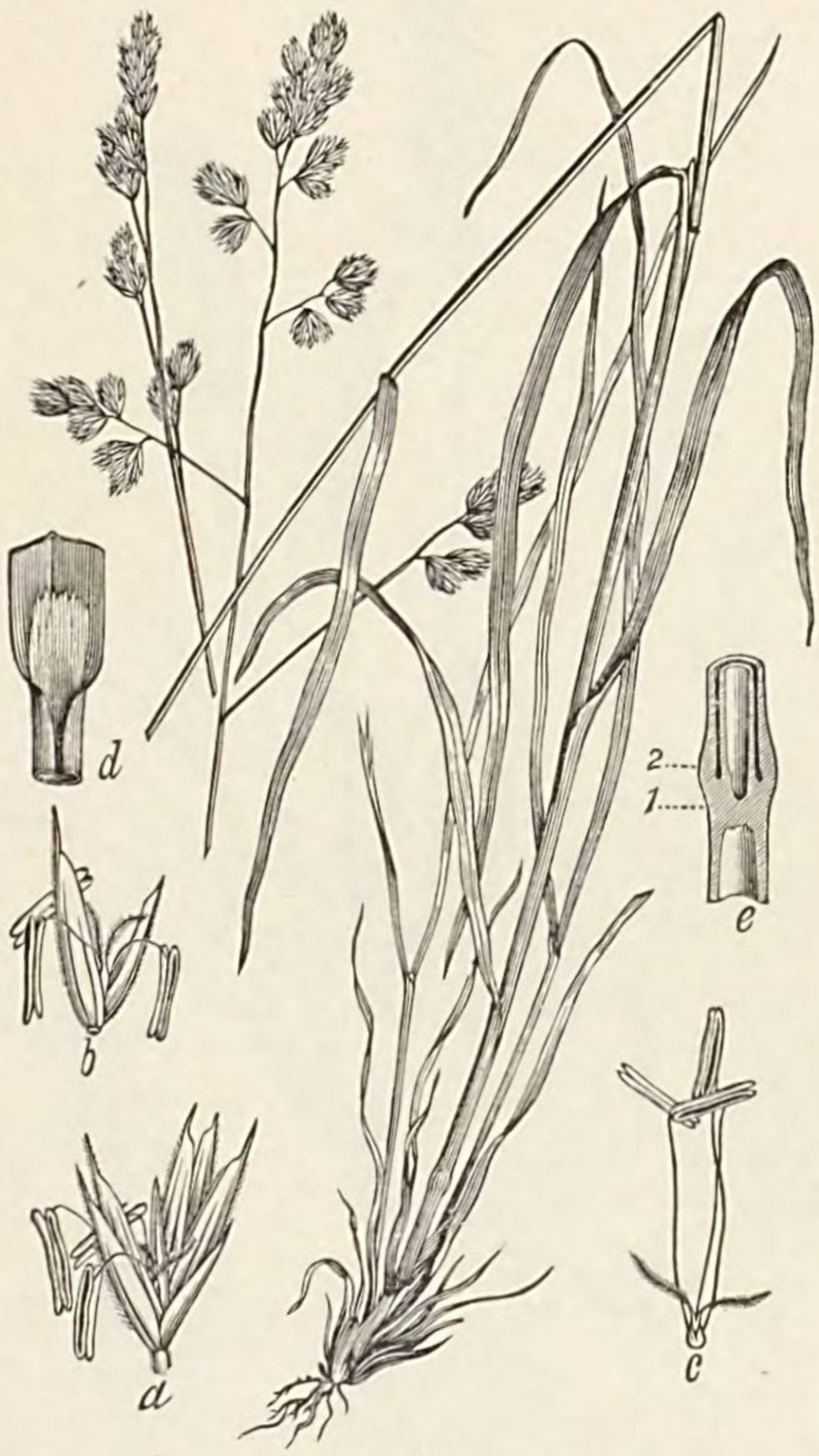

FIG. 269. **Dactylis glomerata** L. ORCHARD-GRASS.—A coarse, erect grass 9 to 12 dm. high, forming dense tufts, with long, flat leaf blades, and spikelets crowded in dense, one-sided clusters at the ends of the panicle branches.—Extensively naturalized in fields and waste ground, New Brunswick to South Carolina, west to Manitoba, Idaho, and Colorado. [Europe.] May–August.

FIG. 270. **Lamarckia aurea** (L.) Moench. GOLDEN-TOP.—A cæspitose, branching annual 1 to 3 dm. high, with elegant one-sided panicles 5 to 8 cm. long.—Introduced into southern and Lower California. [Southern Europe, northern Africa, and Australia.] March-May.

FIG. 271. **Poa chapmaniana** Scribn.—A low, cæspitose annual 1 to 2 dm. high, with ascending, flat leaves and usually narrow panicles 2 to 8 cm. long. Allied to *P. annua*, but more strict in habit of growth.—Dry sandy soil, southern Illinois to Mississippi and Georgia. April, May.

FIG. 272. **Poa alpina** L. MOUNTAIN SPEAR-GRASS.—A slender or stout, cæspitose, erect perennial 0.5 to 3 (usually 1.5) dm. high, with rather broad, flat leaves, and spreading pyramidal panicles of comparatively large spikelets.—Edges of brooks, open grassy mountain slopes, canyons, etc., Newfoundland and Quebec to Hudson Bay and Alaska, south in the mountains to Colorado (alt. 3,600 m.), Utah and California. [Widely distributed, arctic and subalpine.] June–August.

FIG. 273. **Poa pratensis L.** KENTUCKY BLUE-GRASS.—A slender, erect, stoloniferous perennial 3 to 9 dm. high, with narrow, flat leaves and more or less spreading, usually pyramidal panicles.—Fields and meadows throughout the United States and British America, abundantly naturalized in the East, indigenous in the North and West. [Europe and Asia.] Summer. A valuable pasture grass.

FIG. 274. **Poa kelloggii** Vasey; Ill. N. Am. Grasses, **2**: 79. KELLOGG'S SPEAR-GRASS.—A slender, erect or ascending perennial 4 to 6 dm. high, with rather long, flat leaves and open pyramidal panicles 7 to 10 cm. long. Spikelets two- to four-flowered.—California (4705 Bolander).

FIG. 275. **Poa sylvestris** A. Gray. WOODLAND SPEAR-GRASS.—A slender, tufted perennial 3 to 9 dm. high, with an open panicle 10 to 15 cm. long, the branches spreading or reflexed.—Rich woods and thickets, New York to Wisconsin and Nebraska, south to North Carolina, Louisiana and Texas. April-July.

FIG. 276. **Poa brevifolia** Muhl. SOUTHERN SPEAR-GRASS.—An erect perennial 3 to 6 dm. high, with running rootstocks, short culm leaves, and a widely spreading, few-flowered panicle.—Wooded river bluffs and the grassy summits and wooded slopes of mountains, New Jersey to northern Ohio and Illinois, south to North Carolina and Tennessee. March–May.

FIG. 277. **Poa arida** Vasey; Britton and Brown, Ill. Fl., **1**: 208. PRAIRIE SPEAR-GRASS.—An erect, often rather rigid, stoloniferous perennial 3 to 6 dm. high, with flat or folded, stiff leaves and narrow, rather densely flowered panicles 8 to 15 cm. long.—Meadows and low grounds, Northwest Territory to Kansas and Arizona. April-August.

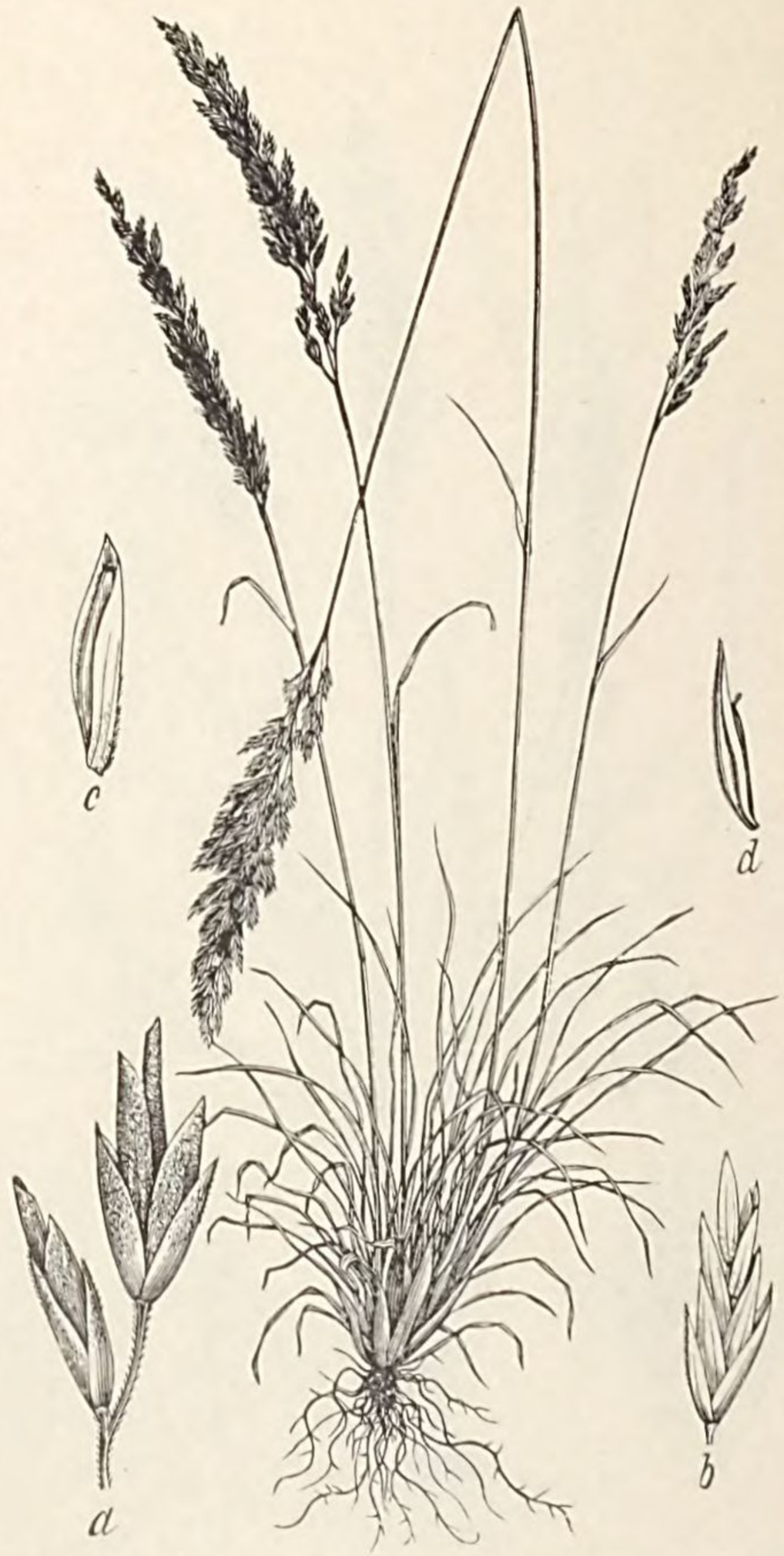

FIG. 278. **Poa buckleyana** Nash; Britton and Brown, Ill. Fl., 1: 208 (*Poa tenuifolia* Buckley). BUNCH RED-TOP.—A rather slender, erect perennial "bunch grass" 3 to 6 dm. high, with numerous, soft radical leaves and a narrow panicle.—Usually in dry soil of "bench" lands, mountain slopes, elevated prairies, etc. (alt. 450 to 3,900 m.), South Dakota to British Columbia, Colorado, and California. May–September.

FIG. 279. **Graphephorum melicoideum** (Michx.) Beauv.—A rather slender, erect, pale-green, cæspitose perennial 3 to 6 dm. high, with flat leaves and loosely flowered, nodding panicles 7 to 14 cm. long.—Rocky or gravelly river shores, low woods (sometimes pine woods), etc., Anticosti Island to Vermont, Michigan, and Northwest Territory. August, September. (Allied to Trisetum.)

FIG. 280. **Panicularia aquatica** (Sm.) Kuntze (*Glyceria aquatica* J. E. Smith). REED MEADOW-GRASS.—A stout perennial 9 to 15 dm. high, with rather broad, flat leaf blades and an ample open panicle.—Shaded banks of streams, wet meadows, moist thickets, etc., New Brunswick to Alaska, south to Pennsylvania, Tennessee, Nebraska, New Mexico, and southern California. June-August.

FIG. 281. **Panicularia nervata** (Willd.) Kuntze (*Glyceria nervata* Trin.). FOWL MEADOW-GRASS.—A leafy perennial 3 to 9 dm. high, with an expanded, nodding panicle, and rather small spikelets.—Wet meadows, marshes, moist thickets, etc., Newfoundland to Florida, west to British Columbia, California, and Arizona. June–September.

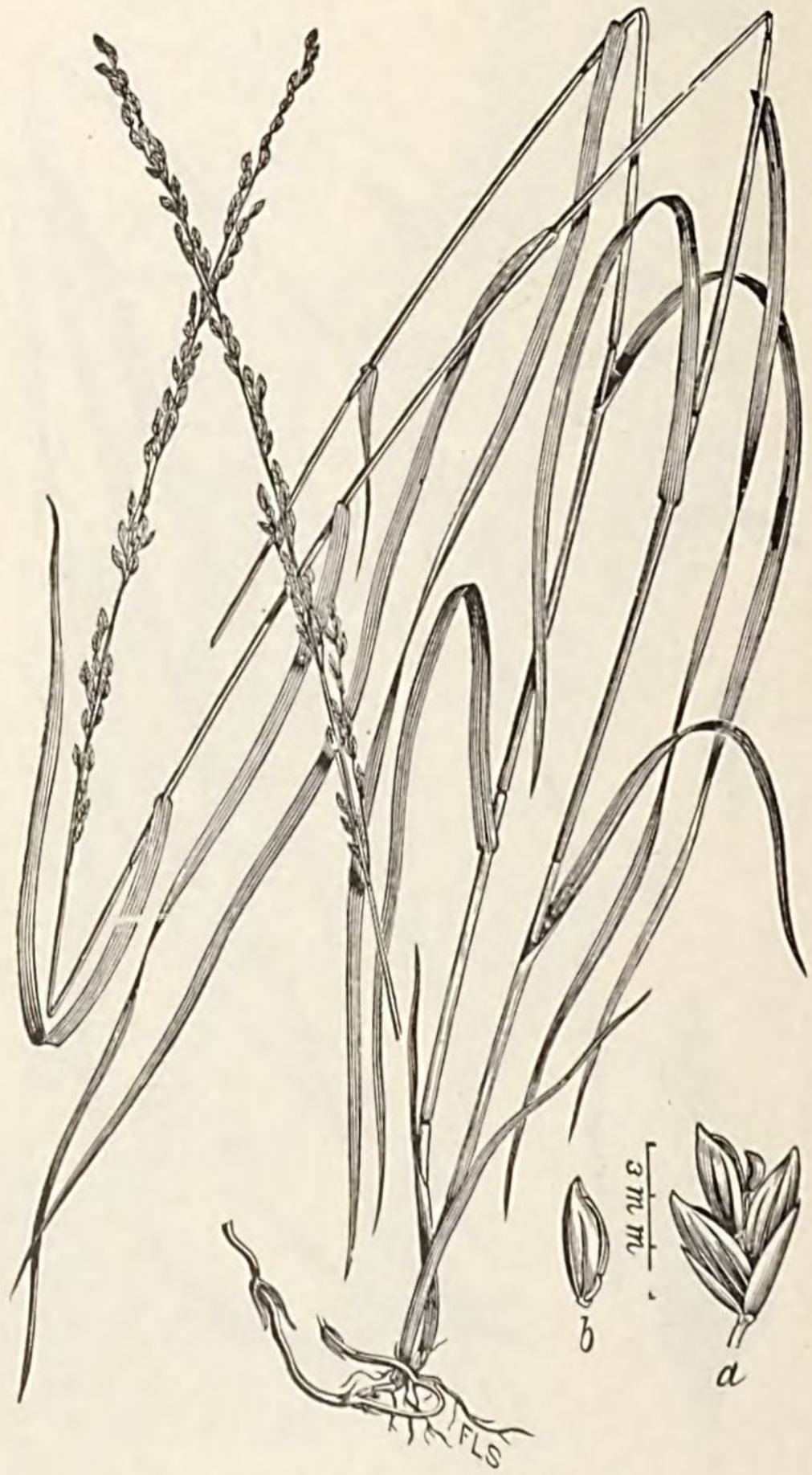

FIG. 282. **Panicularia elongata** (Torr.) Kuntze (*Glyceria elongata* Trin.) (*Poa elongata* Torr.).—An erect perennial 6 to 9 dm. high, with flat leaf blades and narrow, rather densely flowered panicles.—In rich, wet woods, Newfoundland and New Brunswick to North Carolina, west to Quebec, Minnesota, and Kentucky. July-September.

FIG. 283. **Panicularia pallida** (Torr.) Kuntze (*Glyceria pallida* Trin. *Windsoria pallida* Torr.). PALE MANNA-GRASS.—A perennial, with slender stems 3 to 9 dm. long, ascending from a more or less decumbent base, and a lax, few-flowered panicle with ascending branches.—Bogs, banks of streams and ponds, Cape Breton to Ontario, south to Virginia, eastern Tennessee and Indiana. June–August.

FIG. 284. **Panicularia canadensis** (Michx.) Kuntze; Britton and Brown, Ill. Fl., **1**: 211 (*Glyceria canadensis* Trin.). RATTLESNAKE-GRASS.—A stout, native perennial 6 to 9 dm. high, with flat leaves, and ample, nodding panicles of rather large spikelets.—Marshes and ditches, Newfoundland and Nova Scotia to Minnesota, south to New Jersey, Ohio, and Kansas. June–August.

FIG. 285. **Panicularia fluitans** (L.) Kuntze (*Glyceria fluitans* R. Br.). FLOATING MANNA-GRASS.—An erect grass 9 to 15 dm. high with somewhat flattened culms, long leaves, and a narrow panicle about 3 dm. long.—Wet places, often in running water, Newfoundland to Alaska, south to North Carolina, Tennessee, Texas, and California. [Widely distributed in temperate regions.] May–September.

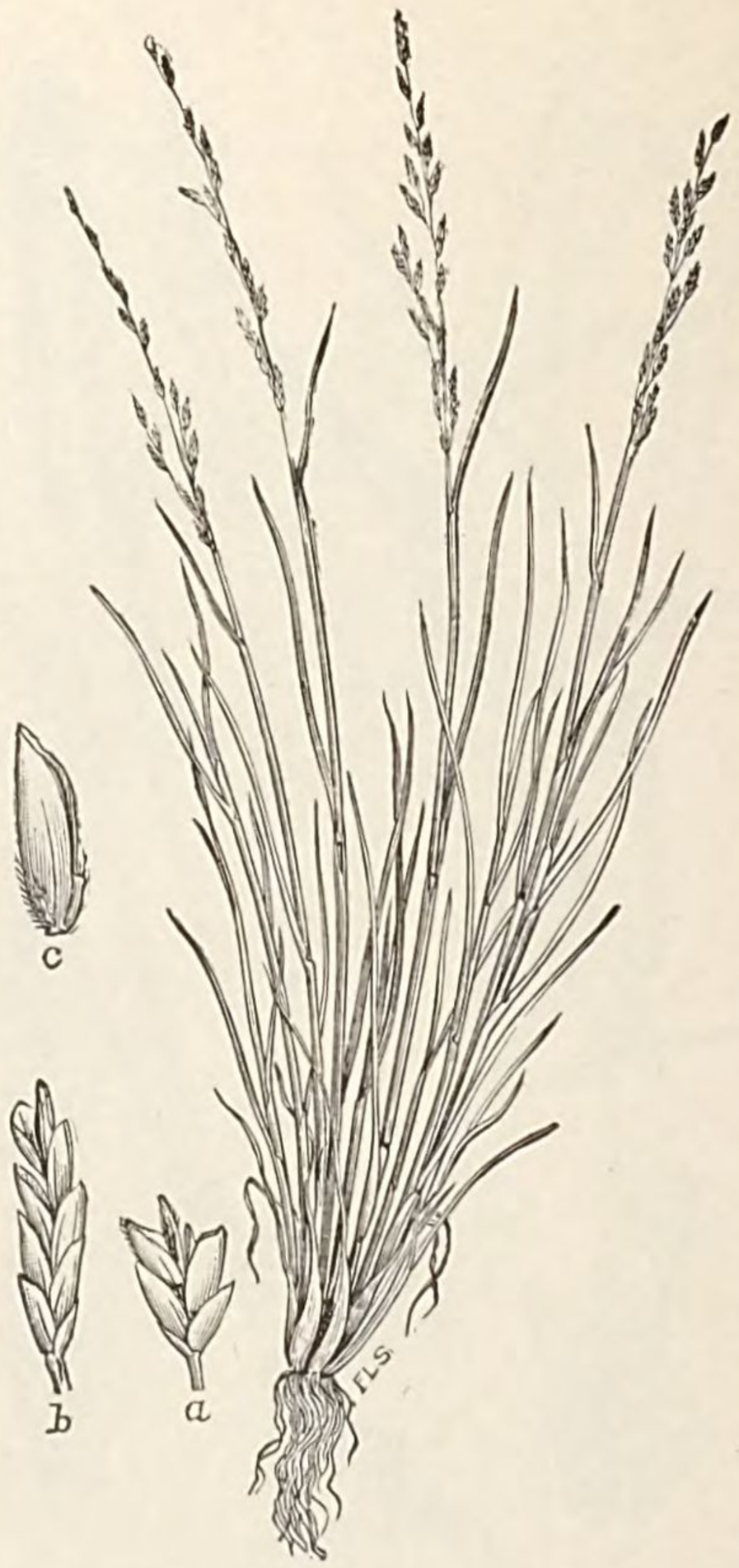

FIG. 286. **Puccinellia maritima** (Huds.) Parl. (*Poa maritima* Huds.; *Glyceria maritima* M. & K.). SEA SPEAR-GRASS.—A slender perennial 2 to 5 dm. high, from creeping rootstocks, with narrow, flat, or folded leaves, and more or less expanded panicles 8 to 12 cm. long.—Salt marshes and beaches along the coast, Labrador to southern New England, and Alaska to British Columbia; also on ballast and waste ground in sea ports farther south. [Europe and Asia.] July, August.

FIG. 287. **Festuca elatior arundinacea** (Schreb.) Hack. REED FESCUE.—A stout, leafy perennial 9 to 12 dm. high, with broad, flat leaves, and ample, elongated panicles often 3 dm. long.—Introduced here and there, District of Columbia, Michigan, Utah, Oregon, etc. [Europe.] August.

FIG. 288. **Festuca elatior pratensis** (Huds.) Hack. MEADOW FESCUE.—An upright perennial 6 to 9 dm. high, with numerous flat leaves and a rather narrow panicle 10 to 20 cm. long.—In fields and waysides, introduced, Nova Scotia to North Carolina, west to Washington, Oregon, and Kansas. June–August.

FIG. 289. **Festuca rubra glaucescens** Hack.; Beal, Grasses N. Am., **2** : 606. TENNESSEE FESCUE.—A slender perennial 3 to 6 dm. high, with creeping rootstocks, erect or ascending stems, very narrow, usually glaucous leaves, and lax, nodding panicles. Forms a dense turf.—Bluffs of Cumberland River, Nashville, Tenn. **May.**

FIG. 290. **Bromus inermis** Leyss. SMOOTH BROME or HUNGARIAN BROME-GRASS.—An erect perennial 6 to 15 dm. high, with creeping rootstocks, open panicles 12 to 18 cm. long, and five- to nine flowered, awnless spikelets 2 to 3 cm. long.—A native of Europe, introduced and cultivated in many parts of the United States for hay. June, July.

FIG. 291. **Bromus secalinus** L. CHESS or CHEAT.—An erect annual 6 to 9 dm. high, with flat leaves, more or less expanded panicles, and turgid, short-awned spikelets, which are pendulous in fruit.—Naturalized in cultivated and waste grounds, especially in grain fields. [Europe and Asia.] June-August.

FIG. 292. **Bromus brizaeformis** Fisch. & Mey. BRIZA-LIKE BROME-GRASS.—A slender, erect, cæspitose annual 2 to 5 dm. high, with soft, flat leaves and nodding panicles of large ten- to fifteen-flowered spikelets 2 to 3 cm. long.—Meadows and cultivated fields, introduced, Montana to Washington, south to Utah, Nevada, and California; sparingly in Massachusetts, New York, and Pennsylvania. [Europe and Asia.] June–August.

FIG. 293. **Bromus unioloides** (Willd.) HBK. RESCUE-GRASS.—An erect, usually annual grass, 3 to 9 dm. high, with more or less pubescent, flat leaf blades, and usually nodding, loose panicles of rather large, strongly flattened spikelets.—Prairies and dry, sandy fields, Indian Territory and Texas to Arizona; naturalized in Alabama. [Mexico and South America.] March–July.

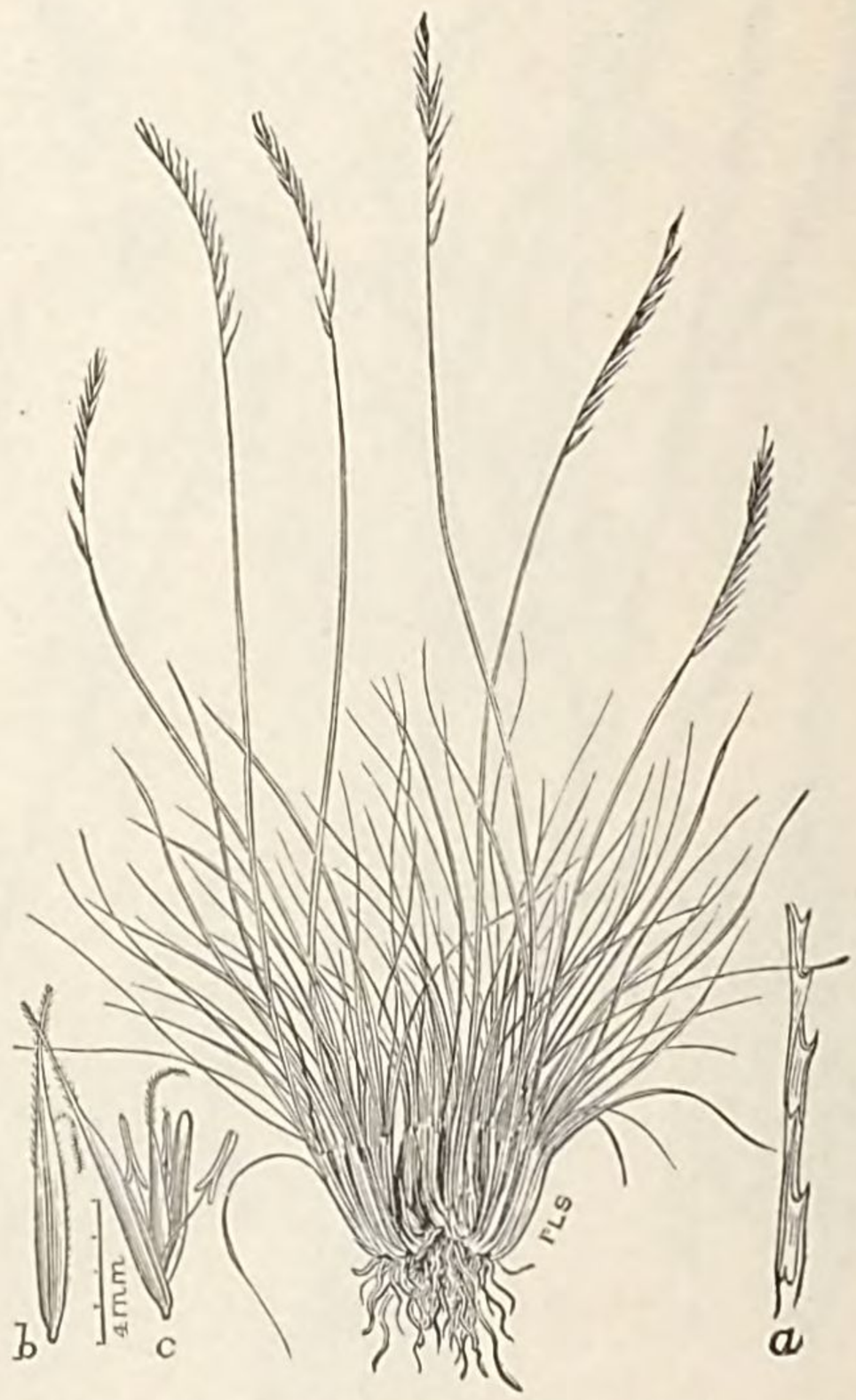

FIG. 294. **Nardus stricta** L.; Britton and Brown, Ill. Fl., **1**: 224. WIRE BENT.--A glabrous, densely cæspitose perennial, with stout, creeping rootstocks, setaceous leaves, and erect, filiform, rigid culms, 10 to 20 cm. high.—Introduced at Amherst, Mass.; rocky river banks, Newfoundland. [Europe, Greenland and Azores.] August.

FIG. 295. **Lolium perenne** L. RYE-GRASS.—A smooth, leafy perennial 3 to 9 dm. high, with slender, terminal spikes 7.5 to 25 cm. long.—Lawns, fields, and waysides, naturalized, Canada to North Carolina, west to Ohio and Tennessee; California and Arizona. [Europe and Asia.] May–August.

FIG. 296. **Lolium italicum** A. Br. ITALIAN RYE-GRASS.—A biennial or perennial grass 6 to 9 dm. high, with slender, usually somewhat nodding, terminal spikes, and short-awned spikelets. A valuable hay grass.—Introduced here and there through cultivation, especially on the Pacific Slope.

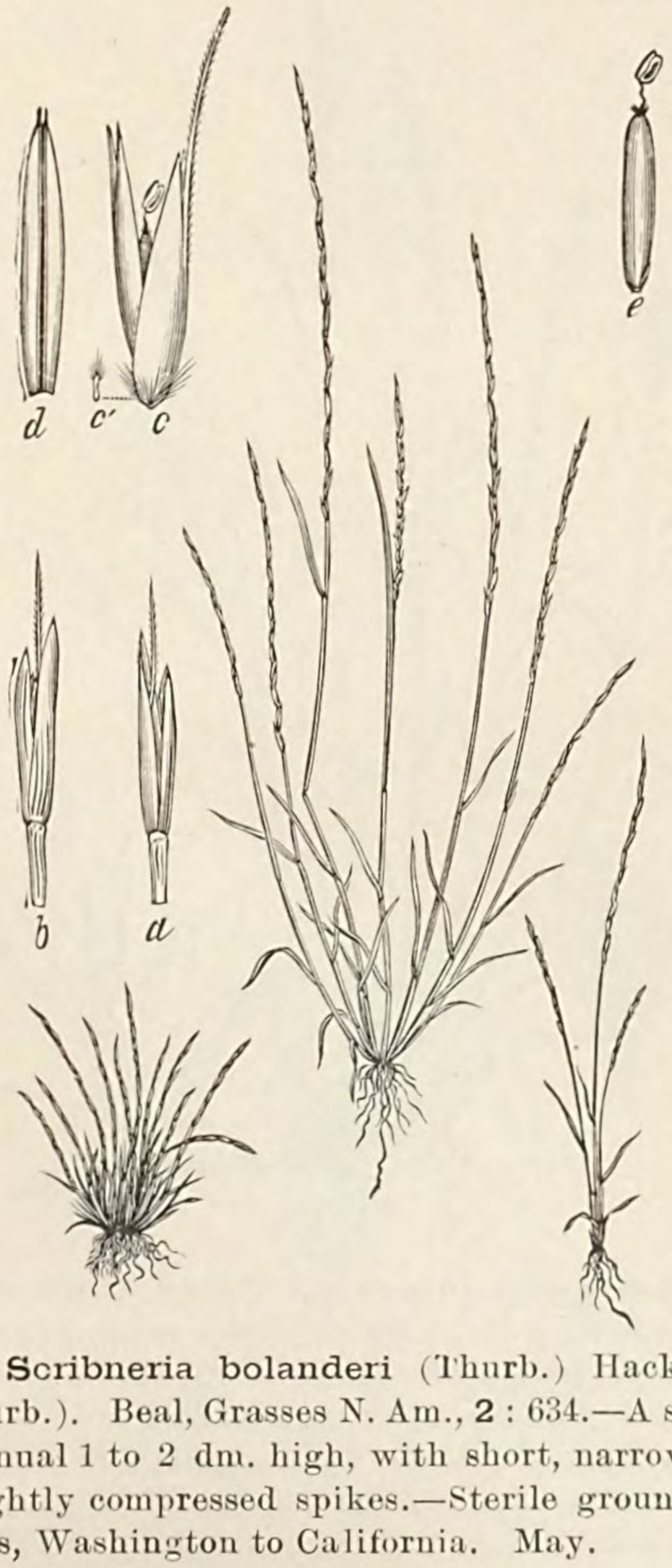

FIG. 297. **Scribneria bolanderi** (Thurb.) Hack. (*Lepturus bolanderi* Thurb.). Beal, Grasses N. Am., **2** : 634.—A slender, wiry, cæspitose annual 1 to 2 dm. high, with short, narrow leaves and terminal, slightly compressed spikes.—Sterile grounds, hillsides, and roadsides, Washington to California. May.

FIG. 298. **Agropyron repens** (L.) Beauv. (*Triticum repens* L.). COUCH-GRASS.—An erect, stoloniferous perennial 3 to 12 dm. high, with flat leaves, which are pilose along the nerves above, and terminal, densely flowered spikes.—Naturalized in lawns, waysides, and cultivated ground, Newfoundland and Cape Breton to Northwest Territory, south to District of Columbia, Ohio, and Iowa. [Europe and Asia.] June–September.

FIG. 299. **Agropyron scribneri** Vasey; Beal, Grasses N. Am., **2**: 638.—A densely cæspitose perennial 2 to 5 dm. high, with ascending culms, flat leaves, and bearded spikes 5 to 7 cm. long, which readily break up at maturity.—Summits of mountains (alt. 1,800 to 4,200 m.), Montana to Colorado and Arizona. August.

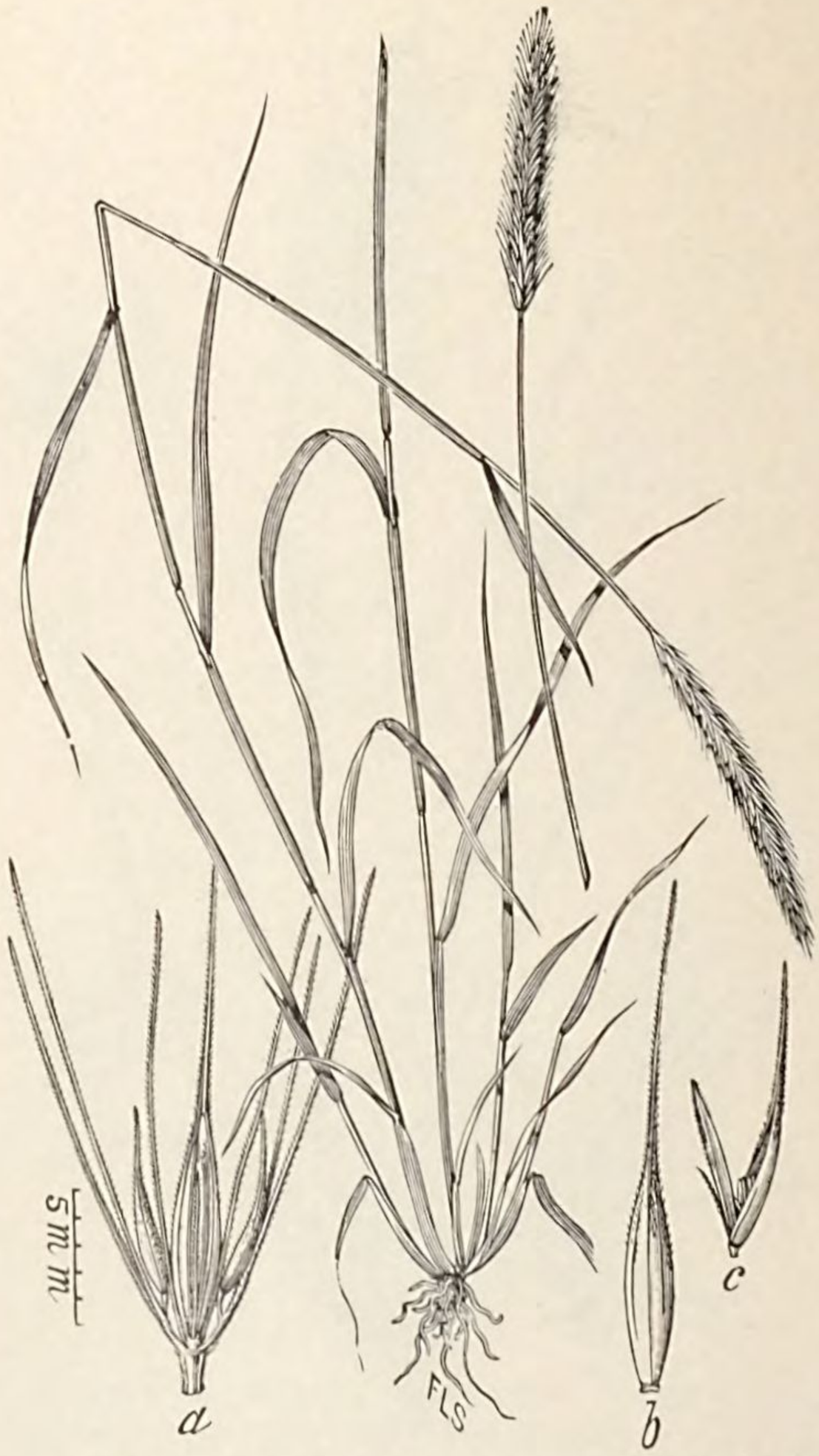

FIG. 300. **Hordeum boreale** Scribn. & Smith, Bull. 4, Div. Agrost., 28 (1897). NORTHERN WILD BARLEY.—A slender, erect and apparently perennial grass 3 to 6 dm. high, with rather broad, flat leaves, smooth culms and terminal spikes 7 to 10 cm. long.—Mountains of California to Alaska and Bering Sea islands. June, July.

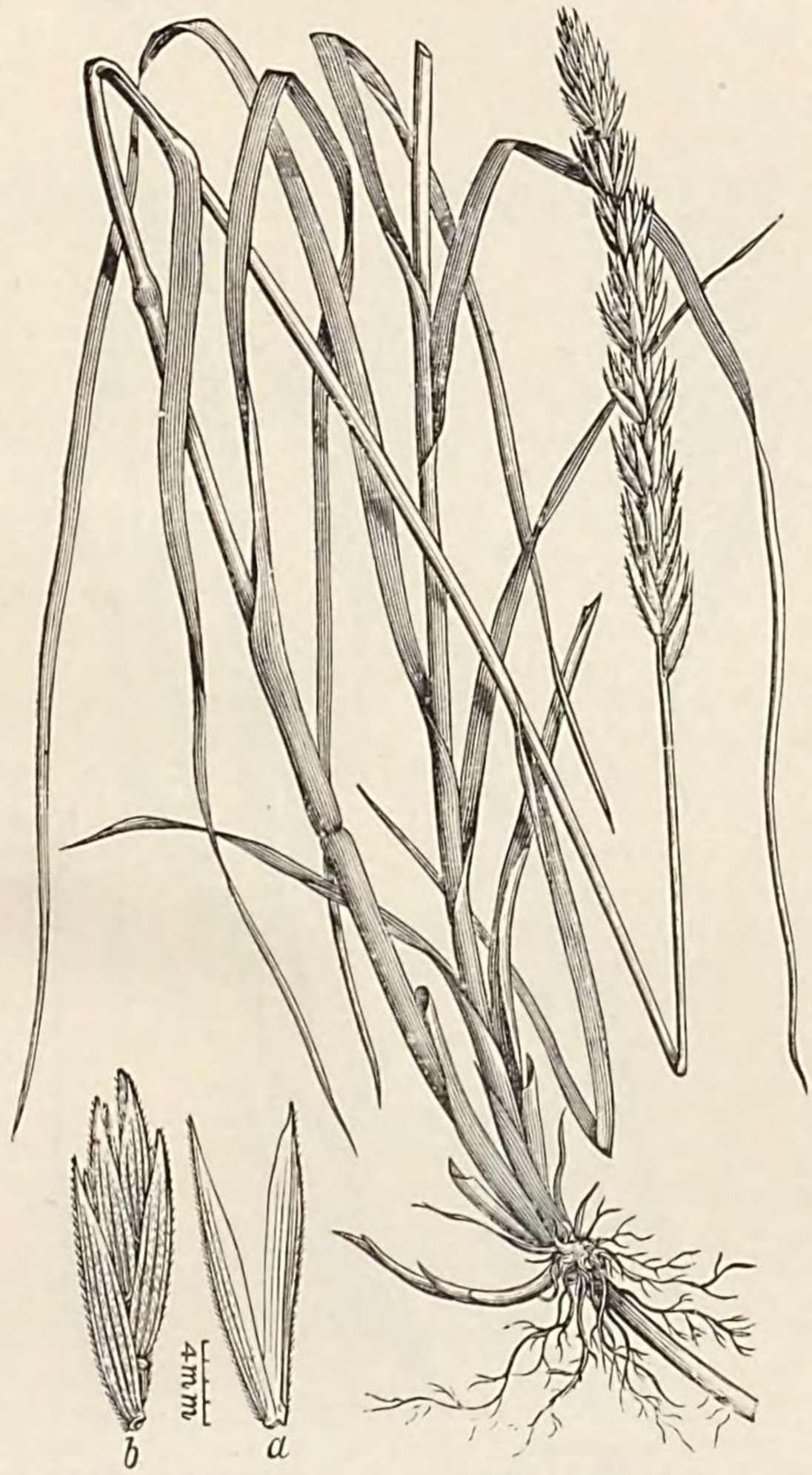

FIG. 301. **Elymus arenarius** L. SEA LYME-GRASS.—A stout, erect perennial 6 to 12 dm. high, with extensively creeping root-stocks, rather firm, flat, sharp-pointed leaves and terminal, usually densely flowered spikes 8 to 25 cm. long. Glumes usually villous.—In maritime sands, Greenland and Labrador to Maine; Alaska to California and on the shores of the Great Lakes. [Europe and Asia.] July, August.

FIG. 302. **Asperella hystrix** (L.) Moench (*Asprella* W. not Schreb.; *Hystrix patula* Moench; *Gymnostichum hystrix* Schreb.). BOTTLE BRUSH.—A smooth, cæspitose perennial 6 to 12 dm. high, with rather broad, flat leaves and terminal spikes 6 to 12 cm. long. Spikelets widely spreading at maturity.—Fertile, rocky woods, New Brunswick and Ontario to Georgia, Alabama, Arkansas, and Minnesota. June–August.

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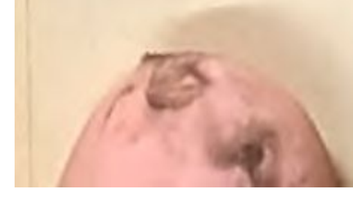

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1.16

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